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GENERAL / SYSTEM SET-UP

INTRODUCTION

SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of the publication date. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions. These are issued as required.

ORDERING REPLACEMENT PARTS

When ordering replacement parts or equipment information, the full part identification number should be included. This applies to all parts : components, kits, or chassis. If the part number is not known, include the chassis or kit number of which it is a part, and a sufficient description of the required component for proper identification.

PERSONNEL SAFETY

The following precautions are recommended for personnel safety :

- DO NOT transmit if someone is within two feet (0.6 meter) of the antenna.
- DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- All equipment should be properly grounded before power-up for safe operation.
- This equipment should be serviced by a qualified technician only.

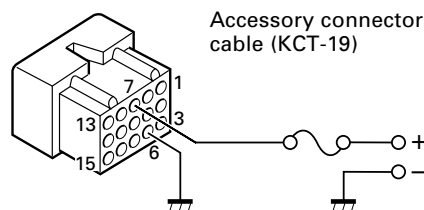
SERVICE

This radio is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained in this manual.

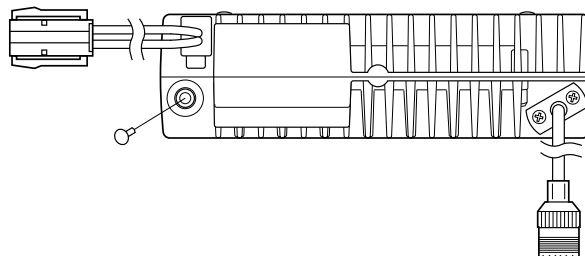
Note

When you modify your radio as described in system set-up, take the following precaution.

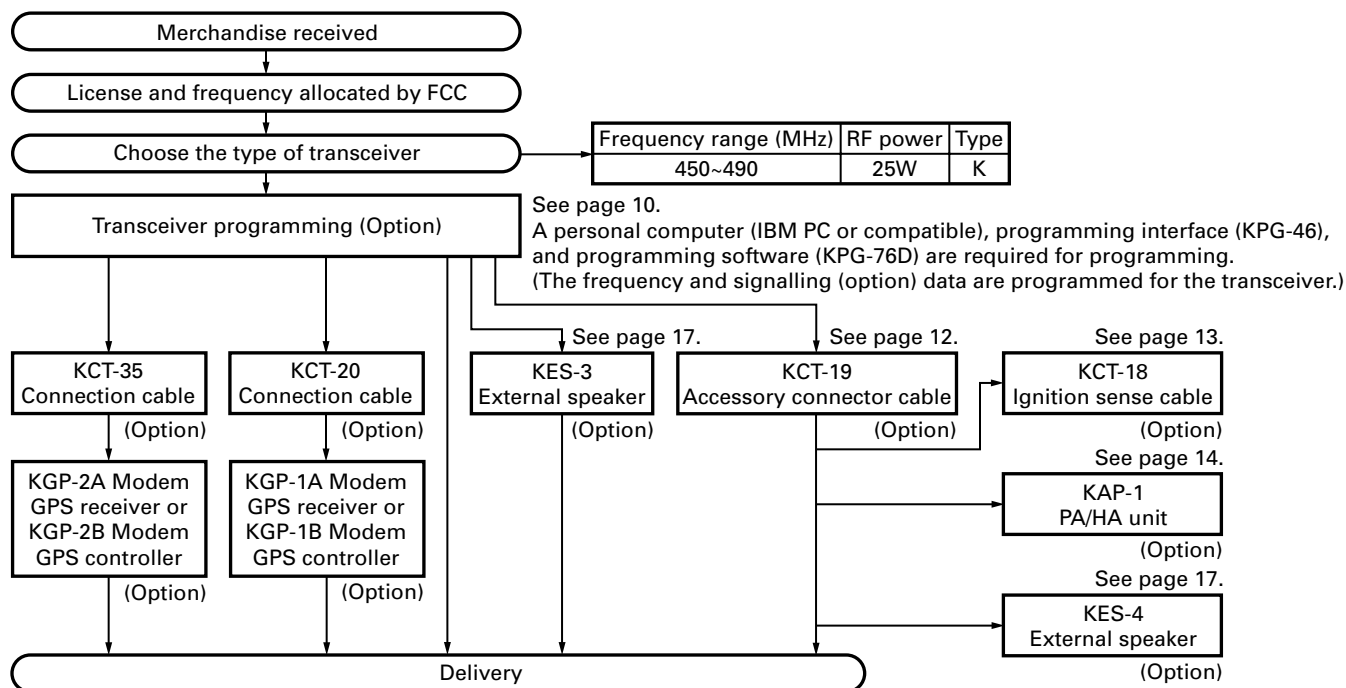
The rating of pin 7 (SB) of the accessory connector cable (KCT-19) on the rear of the radio is 13.6V (1A). Insert a 1A fuse if you use the SB pin for external equipment.



If you do not intend to use the 3.5-mm jack for the external speaker, fit the supplied speaker-jack cap (B09-0235-05) to stop dust and sand getting in.



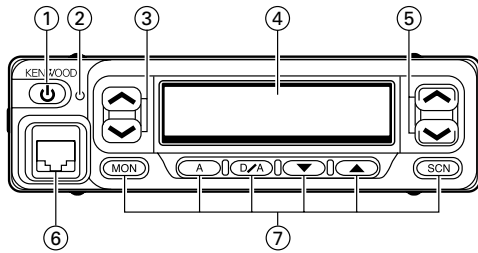
SYSTEM SET-UP



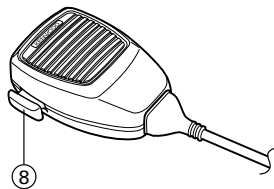
OPERATING FEATURES

1. Controls and Functions

1-1. Front Panel

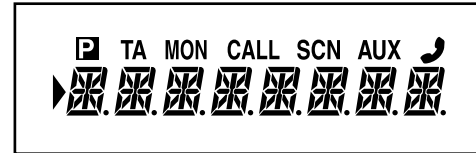


1-2. Microphone



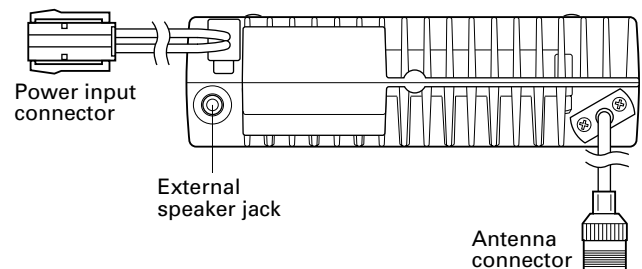
- ① (Power) switch
Press to switch the transceiver ON (or OFF).
- ② LED indicator
Lights red while transmitting.
- ③ keys
Press these keys to activate their programmable auxiliary functions (page 4). The default settings are Volume Up and Volume Down.
- ④ Display
See right for more information.
- ⑤ keys
Press these keys to activate their programmable auxiliary functions (page 4). The default settings are System Up and System Down.
- ⑥ Microphone jack
Insert the microphone plug into this connector.
- ⑦ MON, A, D/A, , , and SCN keys
Press these keys to activate their programmable auxiliary functions (page 4).
- ⑧ PTT switch
To transmit, press and hold this switch, then speak into the microphone. Release to receive.

1-3. Display







| Indicator | Description |
|-------------|---|
| P | Appears when the selected group is programmed as priority. |
| TA | Appears when the selected group is programmed as Talk Around. |
| MON | Appears when the key programmed as Monitor is pressed. |
| CALL | If programmed by your dealer, appears when you receive an ID. |
| SCN | Appears when you are using Scan mode. |
| AUX | Appears when the auxiliary function is activated. |
| | In trunked operation, appears when the selected group is programmed as telephone IDs. |
| | Appears when the selected system is removed from the scanning sequence. |
| | Displays the system and group numbers. Your dealer can program system and group names with up to 8 characters, in place of numbers. |

1-4. Rear Panel



OPERATING FEATURES

1-5. Programmable Auxiliary Functions

You can program the  (left side),  (right side), MON, A, D/A, , , and SCN keys with the functions listed below.

- AUX
- Display Character
- DTMF ID (BOT)
- DTMF ID (EOT)
- Emergency *¹
- Group Down
- Group Up
- Home Group
- Horn Alert
- Key Lock
- Memory (RCL)
- Memory (RCL/STO)
- Memory (STO)
- Monitor Momentary
- Monitor Toggle
- None (No function)
- Public Address
- Redial
- Scan
- Scan Del/Add
- Scan Temporary Delete
- Squelch Off Momentary
- Squelch Off Toggle
- System Down
- System Up
- Telephone Disconnect
- Volume Down
- Volume Up

*1 : This function can be used only with a foot switch.

2. Operation Features

The TK-863G is a UHF FM radio designed to operate in trunking format. The programmable features are summarized.

3. Transceiver Controls and Indicators

3-1. Front Panel Controls

All the keys on the front panel are momentary-type push buttons. The functions of these keys are explained below.

• POWER key

Transceiver POWER key. When the power is switched off, all the parameters are stored in memory. When the power is switched on again, the transceiver returns to the previous conditions.

• SYSTEM UP/DOWN key (Programmable)

• ▲/▼ key (Programmable)

• SCAN key (Programmable)

• MONITOR key (Programmable)

• A, D/A key (Programmable)

• VOLUME UP/DOWN key (Programmable)

• TX LED

The TX indicator (Red LED) shows that you are transmitting.

3-2. Programmable Keys

The FPU (KPG-76D) enables programmable keys to select the following functions.

None, AUX, DTMF ID (BOT), DTMF ID (EOT), Display Character, Emergency, Group Down, Group Up, Home Group, Horn Alert, Key Lock, Memory (RCL/STO), Memory (RCL), Memory (STO), Monitor Momentary, Monitor Toggle, Public Address, Redial, Scan, Scan Del/Add, Scan Temporary Delete, Squelch Off Momentary, Squelch Off Toggle, System Down, System Up, Telephone Disconnect, Volume Down and Volume Up.

• AUX

If this key is pressed, "AUX" icon lights on the display and AUX port which is inside of the transceiver turns to the active level. If pressed again, the "AUX" icon goes off and the AUX ports turns to the lower level.

• Display character

This key switches the LCD display between the system and group number and the system and group name.

• DTMF ID (BOT)

In conventional mode, if you press this key, a predetermined DTMF ID (Begin of TX) will be sent automatically.

• DTMF ID (EOT)

In conventional mode, if you press this key, a predetermined DTMF ID (End of TX) will be sent automatically.

• Emergency

Pressing this key for longer than the programmed "Emergency Key Delay Time" causes the transceiver to enter the Emergency mode and display the "Emergency Display" setting. The transceiver automatically switches to the "Emergency System/Group" and transmits for the programmed "Duration of Transmission Mode".

The transceiver disables MIC mute while transmitting. After finishing transmission, the transceiver receives for the programmed "Duration of Receiving Mode". The transceiver mutes the speaker while receiving.

OPERATING FEATURES

Following the above sequence, the transceiver continues to transmit and receive. While in Emergency mode, switch the power OFF or press [Emergency] for longer than the programmed "Emergency Key Delay Time" to exit Emergency mode.

Note : This function can be assigned to only the Foot switch.

- **Group up/down**

When the key is pressed each time, the group number to be selected is incremented/decremented and repeats if held for one second or longer.

- **Home group**

Each pressing of the key selects a preset system/group.

- **Horn alert**

If you are called from the base station or other party using signalling for Horn Alert function selected in a group, while you are away from your transceiver, you will be alerted by the vehicle horn or some other type of external alert. To turn the horn alert function on, press this key. A confirmation tone sounds.

If this key is pressed again, the horn alert function is turned off.

- **Key lock**

Pressing this key causes the transceiver to accept entry of only the [Vol Up/Down], [Key lock], [PTT], [Monitor Momentary], [Monitor Toggle], [Squelch Off Momentary], [Squelch Off Toggle], and [Emergency] keys.

- **Memory**

This key allows DTMF memory data to be recalled; up to 32 memories each with a memory dial of up to 16 digits and an A/N of up to 8 digits per memory.

- **Monitor**

Used to release signalling or squelch when operating as a conventional.

- **None**

Sounds error operation beep, and no action will occur. Use this function when the transceiver is required to be more simple operated.

- **Public address**

Public address amplifies the microphone audio, and outputs it through a PA speaker. PA is activated by pressing this key. A confirmation tone sounds, (and the display shows "PA"). PA can be activated at anytime (scanning or non-scanning).

If this key is pressed again, a confirmation tone will sound, (the display will return to the normal group or SCAN display), and the PA function will turn off.

- **Redial**

If you press this key when the system/group is displayed, the last transmitted DTMF code will appear on the display. Pressing the PTT switch at this time will transmit the displayed DTMF code.

- **Scan**

Press this key starts scanning. Pressing this key stops scanning.

- **Scan del/add**

Used to select whether system scan routines are used during system scan. Each pressing of the key (to ON) toggles between lockout and lock. The scan routine is started when on lock. The DEL indicator flashes when the system is on lockout.

- **Scan temporary delete**

This key is temporarily deleted a system being scanned. If you press this key when scan is stopped (when a call is being received from another station), the system is temporarily deleted and scanning restarts.

This key operates even when "Scan Type" is set to "List Type System Scan".

- **System up/down**

When the key is pressed each time, the system number to be selected is incremented/decremented and repeats if held for one second or longer.

- **Telephone disconnect**

Pressing this key ends an RIC connection (disconnects the telephone line).

- **Volume up/down**

When the key is pressed, the volume level is increased/decreased and repeats if held for 200ms or longer.

4. Scan Operating

■ System Scan

System scan can be selected with the "Scan" key by programming the scan feature. When the "Scan" key is pressed and the "SCN" mark appears, scan mode is entered. Scanning starts from the system following the currently displayed system. When a call is received, scanning stops, and the system and group are displayed.

When programming key is touched during scanning, the scan stops and the revert system or group can be changed. Scanning resumes one second after the key is released.

There are two types of system scan.

- **Fix system scan**

All the set systems except locked-out ones are scanned. If the Del/Add feature is assigned to the programmable key, it can be controlled from the front panel.

OPERATING FEATURES

- **List type system scan**

A scan list can be set for each system.

The list to be scanned can be changed by changing the display system.

If many systems have been set, the scan speed can be increased by narrowing the systems to be scanned with scan lists.

■ System Lockout

The system lockout feature is used to lock systems out of the scan sequence, and can be selected by programming in the following two ways;

- **Fixed lockout**

The system to be locked out is selected by programming. When a locked system is selected, the Delete (▶) indicator appears on the left of the SYSTEM indicator. The revert system is scanned even if it is locked out. If there is a locked system, the Delete (▶) indicator flashes during fixed scanning.

- **User selectable lockout**

If the scan lockout feature is programmed to a key, the user can lock systems out of the scan sequence with the key. To lock a system out of the scan sequence, press the key when the system is displayed. The Delete (▶) indicator is displayed on the left of the SYSTEM indicator.

To unlock a system, select the system and press the key. The Delete (▶) indicator disappears to indicate that the system has returned to the scan sequence. The revert system is scanned even if it is locked out. If there a locked system, the Delete (▶) indicator flashes during fixed scanning. If all systems are locked out, the scan stops and only the revert system is received.

■ Drop-out Delay Time (Scan Resume Time)

If a call is received during scan, the scan stops. The scan resume time can be programmed as 0 to 300 seconds in one-second increments. The default value is 3 seconds.

■ Dwell Time

The dwell time is the time after transmission ends until the scan resumes in scan mode. It can be set 0 to 300 seconds by programming. The default value is 3 seconds.

■ System/Group Revert

System/group revert can be programmed for one of the following;

- **Last called revert**

The system or group changes to the revert system or group when a call is received with the system or group being scanned.

- **Last used revert**

If a system/group call is received during scanning and the PTT button is pressed for transmission and response within the drop out delay time, the system or group is assigned as the new revert system or group.

- **Selected revert**

If the system/group was changed while scanning, the newly selected system/group.

- **Selected + Talkback revert**

If the system/group was changed while scanning, the newly selected system/group. The transceiver "talks back" on the current receive group.

■ Scan Message Wait

The time for staying with the home repeater that receives a signal during system scan and monitoring data messages can be programmed. If there is no signal from the home repeater, the system is scanned for about 50ms. If there is a signal, three data messages are monitored. Normally, three data messages are monitored for each system, and it can be increased in multiples of three data messages per line to up to eight lines.

If the repeater data message indicates that there is no call, data monitoring is terminated and the home repeater of the next system is scanned.

■ Group Scan Operation

Group scan can be programmed for each group. In addition to the ID codes of the selected group, the ID codes of the other groups that are permitted for group scan are decoded. (The two fixed ID and block decode codes are always decoded.)

If, during group scanning, a call is received with one of the selectable group ID codes for which group scan is enabled, the group display indicates the group number that the call came in with. That group then becomes the new selected group. Group scan resumes after the specified drop-out delay time or dwell time shared by the system scan elapses.

■ In Conventional System

If QT or DQT is set for the channel, the channels, including signalling, are scanned.

In case of the priority group is set in conventional system, if a group scan (including group scan during a system scan) temporarily stops (receiving) in a group that does not have priority, a look back is performed to the priority group. Look back is performed according to the look back time A and B settings. If a call is received on the priority group, reception immediately switches to the priority group.

OPERATING FEATURES

5. Details of Features

■ Time-out Timer

The time-out timer can be programmed in 15 seconds increments from 15 seconds to ten minutes. If the transmitter is keyed continuously for longer than the programmed time, the transmitter is disabled and a warning tone sounds while the PTT button is held down. The alert tone stops when the PTT button is released.

■ PTT ID

PTT ID provides a DTMF ANI to be sent with every time PTT (beginning of transmission, end of transmission, or both).

You can program PTT ID "on" or "off" for each group. The contents of ID are programmed for each transceiver.

The timing that the transceiver sends ID is programmable.

BOT : DTMF ID (BOT) is sent on beginning of transmission.

EOT : DTMF ID (EOT) is sent on end of transmission.

Both : DTMF ID (BOT) is sent on beginning of transmission and DTMF ID (EOT) is sent on end of transmission.

■ Radio Password

When the password is set in the transceiver, user can not use the transceiver unless enter the correct password.

This code can be up to 6 digits from 0 to 9 and input with the key, and "SCN" key.

■ Off Hook Decode

If the Off hook decode function has been enabled, removing and replacing the microphone on the hook has no effect for decoding QT/DQT.

■ Horn Alert

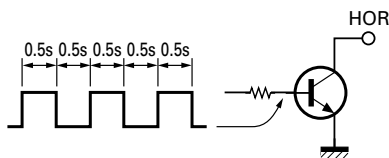
Horn alert can be set to on or off for each group. If horn alert has been set to YES for a group and DEC ID/QT/DQT matches, the horn alert, HOR, is turned on and off.

Either continuous or non-continuous operation can be set by the FPU. The horn alert port is enabled or disabled as follows;

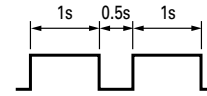
| Off hook horn alert | Hook off | Hook on |
|---------------------|----------|---------|
| Enable | Yes | Yes |
| Disable | No | Yes |

■ Pulse

The horn alert port, HOR, is turned on and off as follows;



The timing when the fixed LTR ID matches is as follows (trunking mode);



■ Continuous

Horn alert can be reset by setting an expiration time from the FPU, pressing the Horn Alert key, or setting off hook.

■ Data TX with QT/DQT

Whether programmed QT/DQT is modulated or not with a data transmission. A radio unit can receive a data message regardless of QT/DQT if the receiving unit is not scanning.

■ Call Indicator

The call indicator can be programmed for each group. In trunked system, it can be set to respond to a selectable decode ID or one of two fixed IDs, except block IDs. When a call is received with a selectable decode ID, the call indicator flashes. When a call is received with a fixed ID, the call indicator lights continuously.

On a conventional system, the call indicator can be programmed to light for each QT or DQT code. It keeps flashing while a call is being received. It is turned off by pressing any front panel key.

■ Free System Ringback

This feature is available only when a telephone interconnect ID code is selected. If a busy tone sounds when the PTT button is pressed, the transceiver enters this mode automatically.

When the PTT button is released, a beep sounds for 400ms to indicate that the mode has been entered. If the scan is on, it is resumed (the "SCN" mark goes on). When any repeater becomes available, a ringing tone sounds and this mode ends.

The mode is terminated when the system, group, scan, PTT, key is changed.

■ System Search

This feature can be programmed to automatically access other programmed systems when the selected system cannot be accessed. If an intercept tone sounds when the PTT button is pressed after setting the mode, the transceiver has entered the mode.

If the group ID is a telephone interconnect ID, the transceiver then attempts to access, in succession, other systems that have a telephone interconnect ID in the revert group location. If the group ID is a dispatch ID, the transceiver attempts to access other systems that have a dispatch ID programmed in the revert group location.

OPERATING FEATURES

If there is no system to be accessed, an intercept tone sounds, the mode is terminated, and the transceiver returns to the first system. If the access is successful, the mode is terminated, and the searched system becomes the new selected system (If during scanning, the scan stops).

■ Transpond

This feature can be programmed to turn on and off for each group. If the ID of the group for which transpond is enabled is received, two data messages (transmit ID and turn-off code) are automatically transmitted if the PTT button is not pressed as a response within the time set (0 to 300 seconds in 1-second increments). If the PTT button is pressed within the time, the transpond is not preformed.

■ Transmit Inhibit

The transceiver can be programmed with a transmit inhibit block of ID codes. If an ID code within this block is decoded the preset time before the PTT button is pressed, transmission is inhibited. The BUSY indicator lights and a busy tone sounds until the PTT button is released to indicate that transmission is not possible (except clear-to talk mode).

■ ARQ Mode

It affects Trunking mode only. Automatic Repeat reQuest (ARQ) mode is a manner to minimize the air traffic of data communication. Also, it enables to occupy the trunking repeater channel for the data communication period.

6. Audible User Feedback Tones

The transceiver outputs various combinations of tones to notify the user of the transceiver operating state. The main tones are listed below.

The high tone is 1477Hz, the mid tone is 941Hz, and the low tone is 770Hz.

■ Power On Tone

This tone is output when the transceiver is turned on. (The high tone is output for 500ms.)

■ Alert Tone

This tone is output when the transceiver is TX inhibition for TOT, and PLL unlocked. It is output until the PTT button is released.

■ Password Agreement Tone

When the correct password is entered, the tone sounds. The optional feature's control tone can be set to yes or no.

■ PTT Release Tone

When you release the PTT switch, the PTT release tone sounds.

■ Busy Tone

Sounds in LTR mode, when you cannot use a repeater (system busy or TX inhibit). Sounds in conventional mode, when busy channel lockout is functioning. You can select yes or no for the optional feature's warning tone.

■ Key Press Tone [A]

Sounds when a key is pressed. For toggle keys, sounds when toggle function is turned on (key press tone [B] sounds when it is turned off). You can select yes or no for the optional feature's control tone.

■ Key Press Tone [B]

Sounds when a key is pressed. For toggle keys, sounds when the toggle function is turned off (key press tone [A] sounds when it is turned on). You can select yes or no for the optional feature's control tone.

■ Key Press Tone [C]

Sounds when a key is pressed. Also sounds when storing data, adding a DTMF code to memory, and when changing test mode settings. You can select yes or no for the optional feature's control tone.

■ Key Input Error Tone

Sounds when a key is pressed but that key cannot be used. You can select yes or no for the optional feature's warning tone.

■ Roll Over Tone

Sounds at the smallest system/group. You can select yes or no for the optional feature's control tone.

■ Transpond Tone

Sounds when an individual call with the correct LTR ID is received.

■ Intercept Tone

This tone indicates that the transceiver is out of range. It indicates that the PTT button is pressed, and transmission has started, but the repeater cannot be connected and talking is not possible. It is output until the PTT button is released. (The mid tone and low tone are output alternately in 200ms intervals.)

■ Delay Tone

This tone is output when the PTT button is pressed and the repeater is accessed three times or more to indicate connection with the repeater is delayed. This tone is the same as the busy tone. (It is not output of clear to talk has been set to yes.)

OPERATING FEATURES / REALIGNMENT

■ Proceed Tone

This tone is output when the PTT button is pressed, transmission starts, and the repeater is connected to indicate that the user can talk if the clear to talk function has been set. (The high tone is output for 100ms.)

■ Free System Ringback Mode Tone, System Search Mode Tone

This tone indicates that the transceiver is free system ringback mode or system search mode. (The mid tone is output for 400ms.)

■ Ringing Tone

This tone indicates that the transceiver can use the repeater in free system ringback mode. (The mid tone and no tone are output eight cycles alternately in 50ms intervals.)

■ System Search Tone

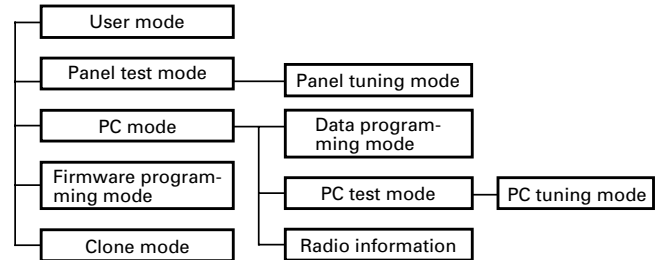
Sounds when the system changes during system search. You can select yes or no for the optional feature's warning tone.

■ System Search End Tone

Sounds when a possible connection to a repeater in system search is not made. You can select yes or no for the optional feature's warning tone.

REALIGNMENT

1. Modes



| Mode | Function |
|---------------------------|--|
| User mode | For normal use. |
| Panel test mode | Used by the dealer to check the fundamental characteristics. |
| Panel tuning mode | Used by the dealer to tune the radio. |
| PC mode | Used for communication between the radio and PC (IBM compatible). |
| Data programming mode | Used to read and write frequency data and other features to and from the radio. |
| PC test mode | Used to check the radio using the PC. This feature is included in the FPU. See panel tuning. |
| Firmware programming mode | Used when changing the main program of the flash memory. |
| Clone mode | Used to transfer programming data from one radio to another. |

2. How to Enter Each Mode

| Mode | Operation |
|---------------------------|------------------------------|
| User mode | Power ON |
| Panel test mode | [SCN]+Power ON (Two seconds) |
| PC mode | Received commands from PC |
| Panel tuning mode | [Panel test mode]+[SCN] |
| Firmware programming mode | [▲]+Power ON (Two seconds) |
| Clone mode | [▼]+Power ON (Two seconds) |

3. For the Panel Test Mode

Setting method refer to ADJUSTMENT.

3-1. For the Panel Tuning Mode

Setting method refer to ADJUSTMENT.

REALIGNMENT

4. Radio Information

Executing this function, "–PC–" appears on the display of the TK-863G while calculation the check sum.

When the calculation is completed, the display returns to normal and PC displays the check sum of the radio.

5. PC Mode

5-1. Preface

The TK-863G transceiver is programmed using a personal computer, a programming interface (KPG-46) and programming software (KPG-76D).

The programming software can be used with an IBM PC or compatible. Figure 1 shows the setup of an IBM PC for programming.

5-2. Connection Procedure

1. Connect the TK-863G to the personal computer with the interface cable.
2. When the Power is switched on, user mode can be entered immediately. When the PC sends a command, the radio enters PC mode.
When data is transmitted from transceiver, the red LED blink.
When data is received by the transceiver, the green LED blink.

Notes :

- The data stored in the personal computer must match model type when it is written into the flash memory.
- Change the TK-863G to PC mode, then attach the interface cable.

5-3. KPG-46 Description

(PC programming interface cable : Option)

The KPG-46 is required to interface the TK-863G to the computer. It has a circuit in its D-subconnector (25-pin) case that converts the RS-232C logic level to the TTL level.

The KPG-46 connects the modular microphone jack of the TK-863G to the computers RS-232C serial port.

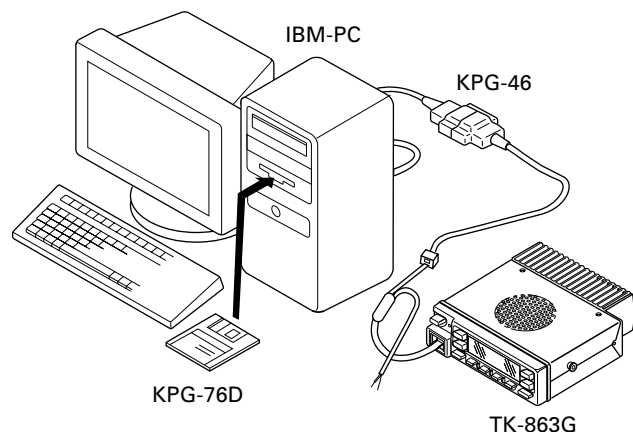


Fig. 1

5-4. Programming Software Description

The KPG-76D programming disk is supplied in 3-1/2" disk format. The software on this disk allows a user to program TK-863G radio via a programming interface cable (KPG-46).

5-5. Programming With IBM PC

If data is transferred to the transceiver from an IBM PC with the KPG-76D, the destination data (basic radio information) for each set can be modified. Normally, it is not necessary to modify the destination data because their values are determined automatically when the frequency range (frequency type) is set.

The values should be modified only if necessary. Data can be programmed into the flash memory in RS-232C format via the modular microphone jack.

6. Firmware Programming Mode

6-1. Preface

Flash memory is mounted on the TK-863G. This allows the TK-863G to be upgraded when new features are released in the future. (For details on how to obtain the firmware, contact Customer Service.)

6-2. Connection Procedure

Connect the TK-863G to the personal computer (IBM PC or compatible) with the interface cable (KPG-46). (Connection is the same as in the PC Mode.)

6-3. Programming

1. Start up the programming software (FPRO EXE.).
2. Set the communications speed (normally, 57600 bps) and communications port in the Setup item.
3. Set the firmware to be updated by file name item.
4. Turn the TK-863G Power ON with the [↵] switch held down. Hold the switch down for two seconds until the display changes to "PROG 576", the BUSY/TX LED lights orange. When "PROG 576" appears, release your finger from the switch.
5. Check the connection between the TK-863G and the personal computer, and make sure that the TK-863G is in Program mode.
6. Click write button in the window. A window opens on the display to indicate the writing progress. When the TK-863G starts to receive data, the BUSY/TX LED lights green.
7. If writing ends successfully, the LED on the TK-863G goes off and the checksum is displayed.
8. If you want to continue programming other TK-863G, repeat steps 4 to 7.

Notes :

- This mode cannot be entered if the Firmware programming mode is set to Disable in the Programming software (KPG-76D).
- When programming the firmware, it is recommend to copy the data from the floppy disk to your hard disk before you update the radio firmware.
Directly copying from the floppy disk to the radio may not work because the access speed is too slow.

REALIGNMENT

6-4. Function

1. If you press the [MON] switch while "PROG 576" is displayed, the checksum is displayed. If you press the [MON] switch again (while the checksum is displayed), "PROG 576" is redisplayed.
2. If you press the [A] switch while "PROG 576" is displayed, the display changes to "PROG 192" to indicate that the write speed is low speed (19200 bps). If you press the [A] switch again while "PROG 192" is displayed, the display changes to "PROG 384", and the write speed becomes the middle speed (38400 bps). If you press the [A] switch again while "PROG 384" is displayed, the display returns to "PROG 576".
4. Power on the slave TK-863G.
5. Connect the cloning cable (No. E30-3382-05) to the modular microphone jacks on the master and slave.
6. Press the [SCN] key on the master while the master displays "CLONE". The data of the master is sent to the slave. While the slave is receiving the data, "-PC-" is displayed. When cloning of data is completed, the master displays "END", and the slave automatically operates in the User mode. The slave can then be operated by the same program as the master.
7. The other slave can be continuously cloned. When the [SCN] key on the master is pressed while the master displays "END", the master displays "CLONE". Carry out the operation in step 4 to 6.

Note :

Normally, write in the high-speed mode.

7. Clone Mode

Programming data can be transferred from one radio to another by connecting them via their modular microphone jacks. The operation is as follows (the transmit radio is the master and the receive radio is the slave).

1. Turn the master TK-863G power ON with the [▼] key held down. If the password is set to the TK-863G, the TK-863G displays "CLN LOCK". If the password is not set, the TK-863G displays "CLONE".
2. When "CLN LOCK" is displayed, only the [^/∨] key and [SCN], and [0] to [9] keys can be accepted. When you enter the correct password, and "CLONE" is displayed, the TK-863G can be used as the cloning master. The following describes how to enter the password.
3. How to enter the password with the microphone keypad; If you press a key while "CLN LOCK" is displayed, the number that was pressed is displayed on the TK-863G. Each press of the key shifts the display in order to the left. When you enter the password and press the [SCN] key, "CLONE" is displayed if the entered password is correct. If the password is incorrect, "CLN LOCK" is redisplayed.
How to enter the password with the [^/∨] key;
If the [^/∨] key is pressed while "CLN LOCK" is displayed, numbers (0 to 9) are displayed flashing. When you press the [SCN] key, the correctly selected number is determined, and the display shifts to the left. If you press the [SCN] key after entering the password in this procedure, "CLONE" is displayed if the entered password is correct. If the password is incorrect, "CLN LOCK" is redisplayed.

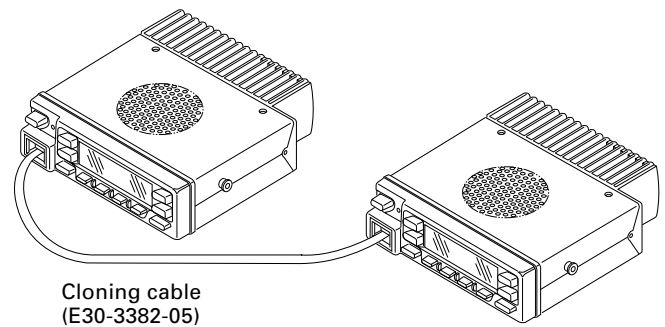


Fig. 2

INSTALLATION

1. Accessory Connection Cable (KCT-19 : Option)

The KCT-19 is an accessory connection cable for connecting external equipment. The connector has 15 pins and the necessary signal lines are selected for use.

1-1. Installing the KCT-19 in the transceiver

1. Remove the upper and lower halves of the transceiver case, and lift the DC cord bushing (❶) from the chassis.
2. Remove the pad as shown in Figure 1 (❷).
3. Insert the KCT-19 cable (❸) into the chassis (❹).
The wire harness band (❺) must be inside the chassis.
4. Replace the DC cord bushing (❻).
5. Connect the KCT-19 to the TX-RX unit (A/2) as shown in Figure 2 (❼).
6. Connect the KCT-19 to the external accessory by inserting the crimp terminal (❸) into the square plug (❾), both of which are supplied with the KCT-19.

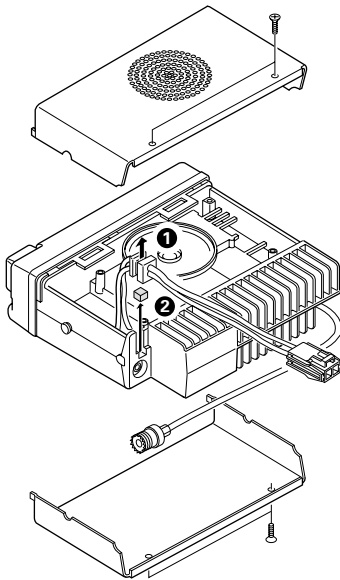


Fig. 1

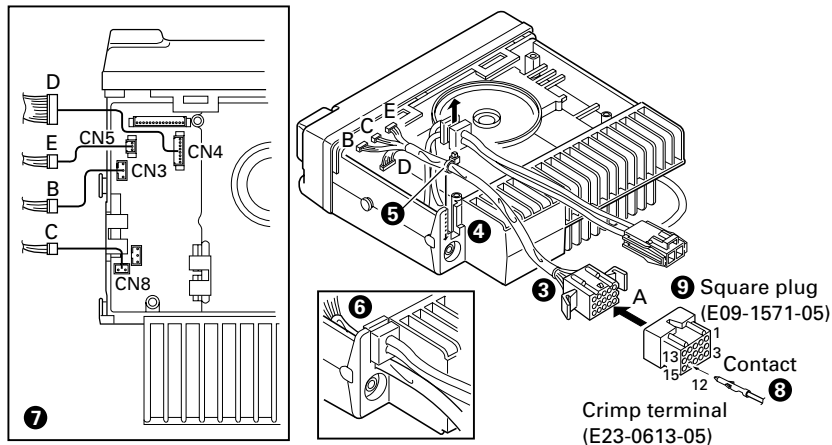


Fig. 2

1-2. KCT-19 Accessory Port Function

| No. (A) | No. (B,C,D,E) | Name | Function | Note |
|------------|------------------|---------|--|------|
| 1 | D-2 | DTC | Data channel control/ External hook input | *1 |
| 2 | D-5 | ME | External microphone ground | |
| 3 | D-3 | IGN | Ignition sense input | |
| 4 | D-1 | DEO | Receiver detector output | |
| 5 | D-6 | MI | External microphone input | |
| 6 | B-2 | E | Ground | |
| 7 | B-3 | SB | Switched B+, DC 13.6V output. Maximum 1A | |
| 8 | D-7 | PTT | External PTT input | *1 |
| 9 | D-4 | DI | Data modulation input | |
| 10 | B-1 | HOR | Horn alert/call output | |
| 11 | D-8 | SQ | Squelch detect output | *1 |
| 12 | C-1 | SP | Speaker audio output | |
| 13 | E-1 | AM | Speaker mute input, active high | |
| 14 | E-2 | MM | MIC mute input, active high | |
| 15 | E-3 | EMG | Foot switch input, active low | *2 |
| | | TXS/LOK | Transmitter sense output, active high | *3 |

*1 : MDT mode

*2 : Emergency mode

*3 : Foot switch setting : None

INSTALLATION

2. Accessory Terminal (TX-RX Unit)

2-1. External Connector Accessory Terminal Method

| No. | Name | I/O | Description | Note |
|-----|---------|-----|---|------|
| CN1 | 1 8C | O | DC 8V output | |
| | 2 5S | O | DC 5V output | |
| | 3 AUX5 | O | | |
| | 4 AUX6 | O | Auxiliary output | |
| | 5 NC | – | Non-connection | |
| | 6 AUX3 | O | SQ : Squelch detect output | *1 |
| | 7 AUX1 | I | PTT : External PTT input | *1 |
| | 8 AUX4 | TXD | | |
| | 9 AUX2 | RXD | | |
| | | I | DTC : Data channel control/ External hook input | |
| | 10 ALT | I | Alert tone input | |
| | 11 AFO | O | Receiver audio signal output | |
| | 12 AFI | I | Receiver audio signal input | |
| | 13 MII | I | Transmit audio signal input | |
| | 14 MIO | O | Transmit audio signal output | |
| | 15 GND | – | Ground | |
| CN3 | 1 HOR | O | Horn alert/call output | |
| | 2 E | – | Ground | |
| | 3 SB | O | Switched B+, DC 13.6V output, Maximum 1A | |
| CN4 | 1 DEO | O | Receiver detector output Level : 0.35Vrms (Standard modulation) | |
| | 2 DTC | I | Data channel control/ External hook input | |
| | 3 IGN | I | Ignition sense input | |
| | 4 DI | I | Data modulation input | |
| | 5 ME | – | External microphone ground | |
| | 6 MI | I | External microphone input | |
| | 7 PTT | I | External PTT input, active low | |
| | 8 SQ | O | Squelch detect output | |
| CN5 | 1 AM | I | Speaker mute input, active high | |
| | 2 MM | I | MIC mute input, active high | |
| | 3 EMG | I | Foot switch input, active low | *2 |
| | TXS/LOK | O | | *3 |
| CN7 | 1 PA/LI | O | Relay for PA function KAP-1 control | |
| | | O | PA/LI ON : High, PA/LI OFF : Low | |
| | 2 SPO | O | Audio signal output to KAP-1 | |
| | 3 SPI | I | Audio signal input from KAP-1 | |
| CN8 | 1 SP | O | Audio signal output to internal/external speaker | |
| | 2 E | – | Ground | |

*1 : MDT mode

*2 : Emergency mode

*3 : Foot switch setting : None

3. Ignition Sense Cable (KCT-18 : Option)

The KCT-18 is an optional cable for enabling the ignition function. The ignition function lets you turn the power to the transceiver on and off with the car ignition key.

If you use the Horn Alert function or the Manual Relay function, you can turn the function off while driving with the ignition key.

3-1. Connecting the KCT-18 to the Transceiver

1. Install the KCT-19 in the transceiver. (See the KCT-19 section.)
2. Insert the KCT-18 lead terminal (❷) into pin 3 of the square plug (❶) supplied with the KCT-19, then insert the square plug into the KCT-19 connector (❸).

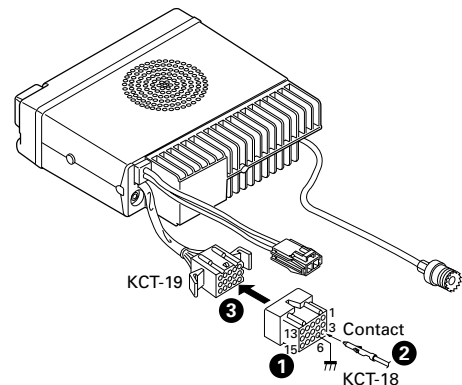


Fig. 3

3-2. Modifying the Transceiver

Modify the transceiver as follows to turn the power or the Horn Alert or Manual Relay function on and off with the ignition key.

1. Remove the lower half of the transceiver case.
2. Set jumper resistors (0Ω) R134 and R135 of the TX-RX unit (A/2) as shown in Table 1.

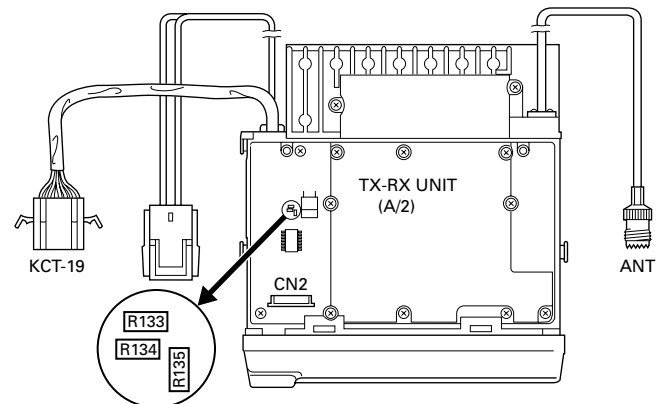


Fig. 4

| Operation when KCT-18 is connected | R134 | R135 |
|---|---------|---------|
| KCT-18 cannot be connected | Enable | Enable |
| Power on/off and Horn Alert or AUX-A on/off | Disable | Enable |
| Horn Alert or AUX-A on/off | Enable | Disable |
| Power cannot be turned on | Disable | Disable |

Table 1 R134 and R135 setup chart

INSTALLATION

4. PA/HA Unit (KAP-1 : Option)

4-1. Installing the KAP-1 in the Transceiver

The Horn Alert (max. 2A drive) and Public Address functions are enabled by inserting the KAP-1 W1 (3P; white/black/red) into CN3 on the TX-RX unit (A/2), inserting W2 (3P; green) into CN7 on the TX-RX unit (A/2), and connecting the KCT-19 (option) to CN2 and CN3 of the KAP-1.

• Installation procedure

1. Open the upper case of the transceiver.
2. Insert the two cables (❶) with connectors from the KAP-1 switch unit into the connectors on the transceiver.
3. Secure the switch unit board to the chassis with a screw (❸). The notch (❷) in the board must be placed at the front left side.
4. Attach the cushion on the top of the KAP-1 switch unit.

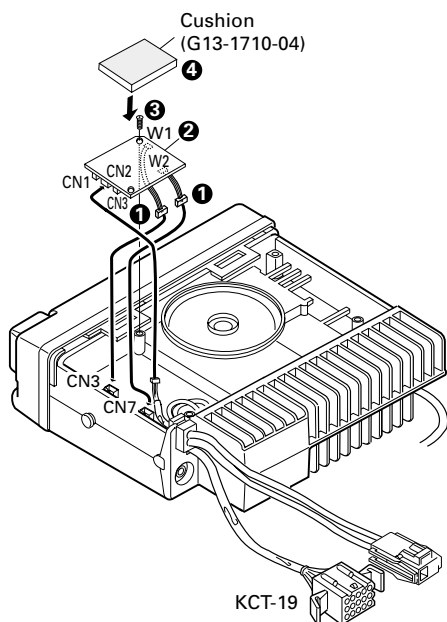


Fig. 5

4-2. Modifying the Transceiver

• Horn alert

The signal from pin 4 of IC9 on the TX-RX unit (A/2) turns Q5 and Q1 on and off and drives KAP-1 HA relay K2 to drive the horn with a maximum of 2A.

The default output is HR1. The relay open output can be obtained between HR1 and HR2 by removing R1 in the KAP-1.

| | R1 | Output form |
|---------------|---------|-------------|
| HR1 (Default) | Enable | |
| HR2 | Disable | |

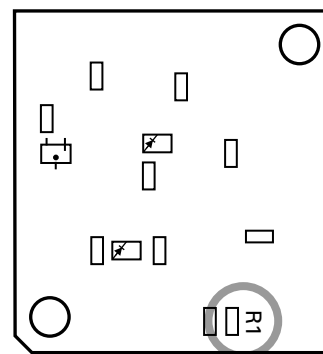


Fig. 6 KAP-1 foil side view

• Public address

The signal from pin 13 of IC9 on the TX-RX unit (A/2) drives PA relay K1 in the KAP-1 and switches the audio power amplifier output between the external PA system (through KCT-19) and internal and external speakers.

To use the PA function, R153 on the TX-RX unit (A/2) must be removed.

| | R153 |
|----------------------------|---------|
| Use the PA function | Disable |
| Do not use the PA function | Enable |

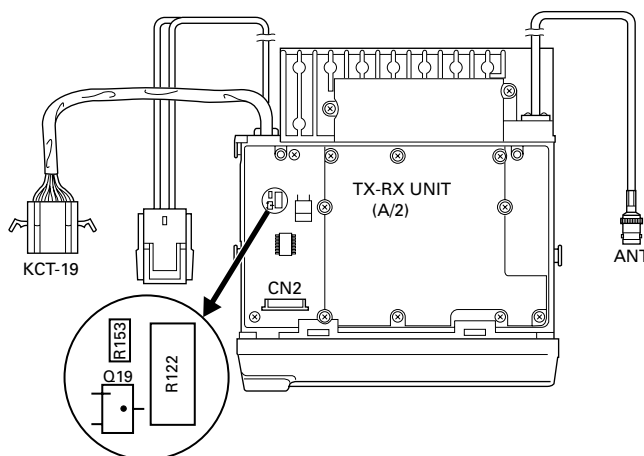


Fig. 7

INSTALLATION

• Others

If the PA and HR2 are not necessary and the speaker output is output to an external unit through the KCT-19, connect the KCT-19 C connector to CN8 on the TX-RX unit (A/2).

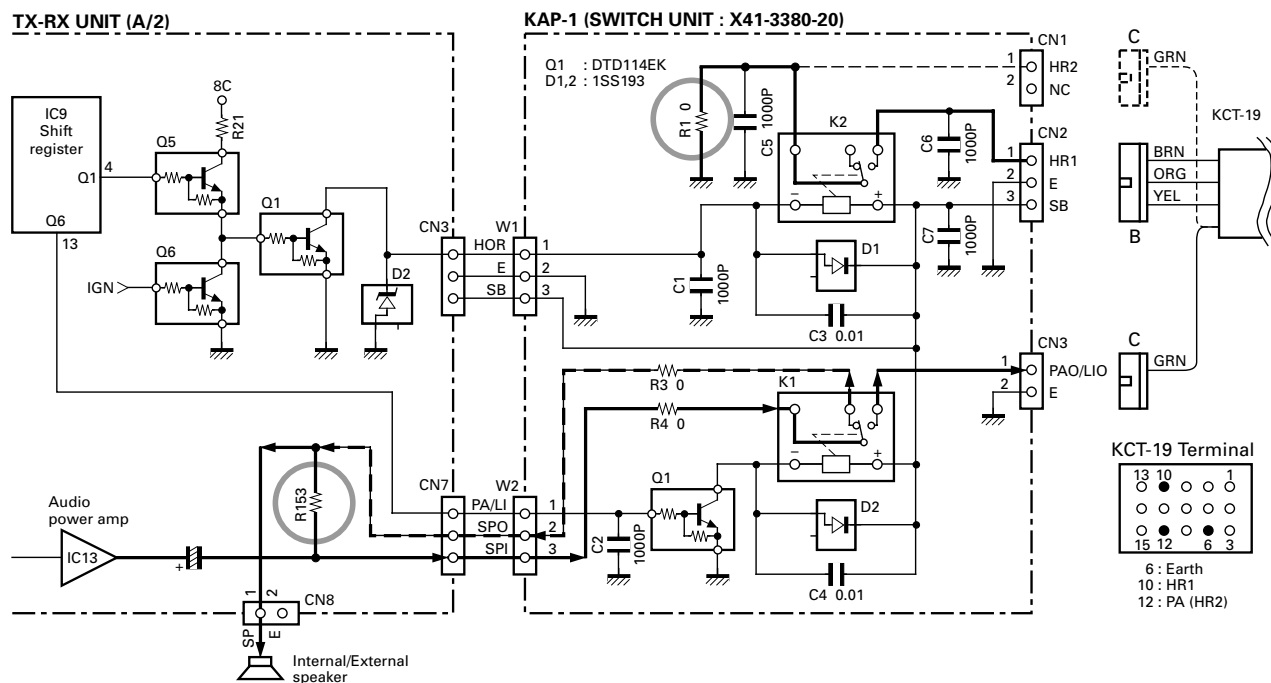


Fig. 8

5. Emergency Mode

5-1. Transceiver Modification Procedure

• Install the foot switch

Install the foot switch through the KCT-19 and KCT-18. When the switch is treaded on, the radio enters the emergency mode.

• Change the power switch circuit

TX-RX unit (B/2) : Control section
\$R705 : Attach (R92-1252-05, 0Ω)

TX-RX unit (A/2) : RF section
R142 : Remove (RK73GB1J473J, 47kΩ)

Once the transceiver is modified, it cannot be turned on and off with the power switch. The power switch turns the LCD backlight and display on and off. (The power is switched on and off by IGNITION SENSE.)

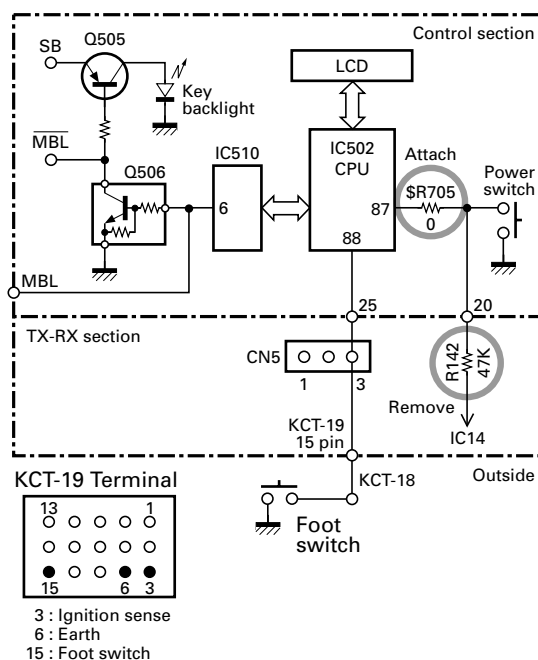
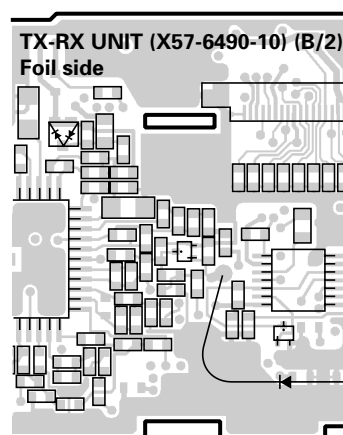
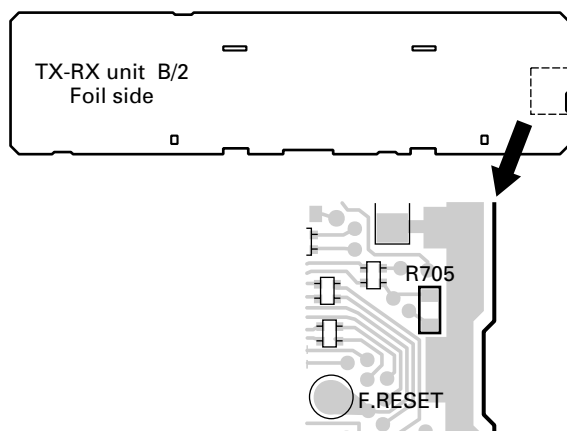


Fig. 9

INSTALLATION



Audio Mute signal from the external device

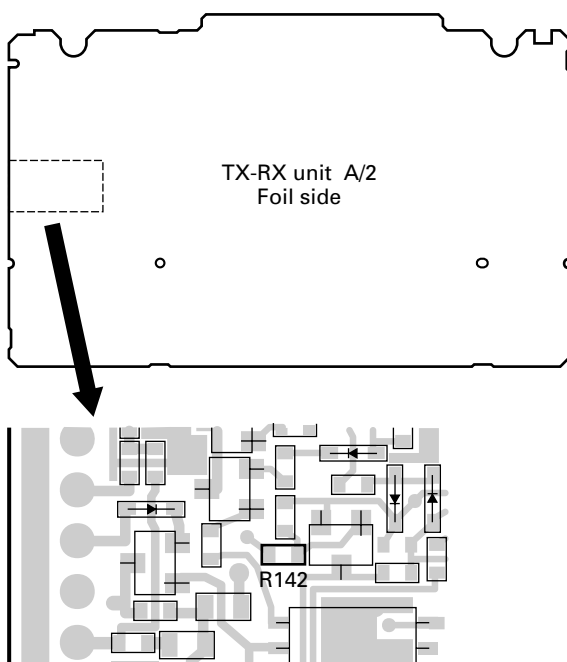


Fig. 10

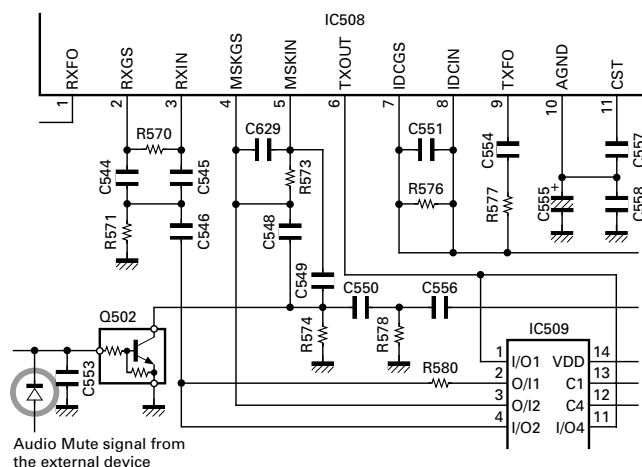


Fig. 11

7. Fitting the Control Panel Upside Down

The TK-863G control panel can be fitted upside down, so the transceiver can be mounted with its internal speaker (in the upper half of the case) facing down in your car.

1. Remove the control panel and the TX-RX unit (B/2) control section. (Fig. 12)

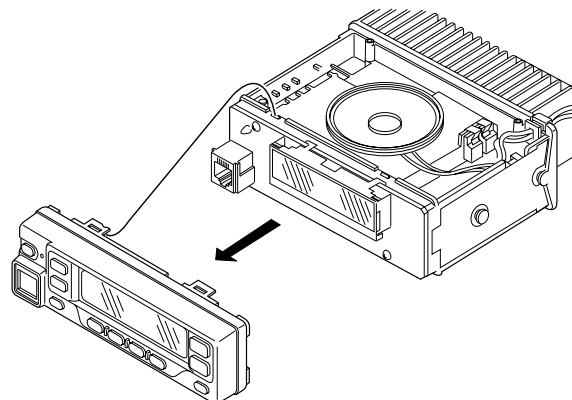


Fig. 12

6. Audio Mute

When the transceiver is connected to external devices, you can control the receiving audio signal using the Audio mute signal of the external device. If you mute the receiving audio signal using this modification, the transceiver does not mute the "Audible User Feedback Tones".

6-1. Transceiver Modification Procedure

Solder the lead of a silicon diode to the base of Q502 on the TX-RX unit (B/2). If you connect this line to the Audio Mute signal of the external device using this diode, the audio signal of the receiver can be controlled.

INSTALLATION

2. Fold the flat cable (❶) in the opposite direction (❷).
3. Rotate the control section (❸) 180 degrees (❹).
4. Insert the flat cable into the control section connector, CN501 (❺).
5. Mount the control section on the transceiver (❻).

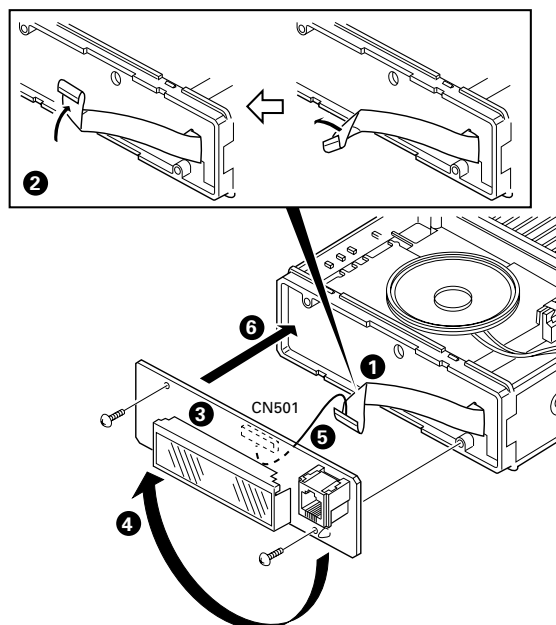


Fig. 13

6. Rotate the control panel 180 degrees and mount it on the transceiver. Refit the two halves of the case to complete installation. (Fig. 14)

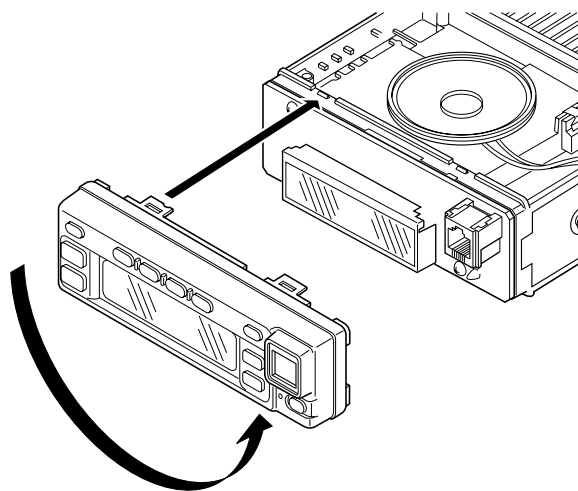


Fig. 14

8. External Speaker

8-1. KES-3 : Option

The KES-3 is an external speaker for the 3.5-mm-diameter speaker jack.

• Connection procedure

1. Connect the KES-3 to the 3.5-mm-diameter speaker jack on the rear of the transceiver.

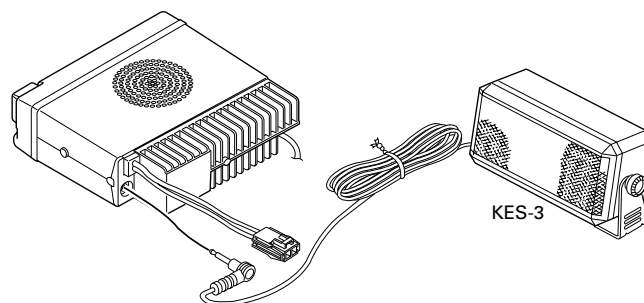


Fig. 15

8-2. KES-4 : Option

The KES-4 is an external speaker used with the accessory connection cable.

• Connection procedure

1. Install the KCT-19 in the transceiver. (See the KCT-19 section.)
2. Insert the crimp terminal into the square plug supplied with the KCT-19.
3. Connect CN8 of the transceiver to connector C of the KCT-19 instead of to the internal speaker connector.

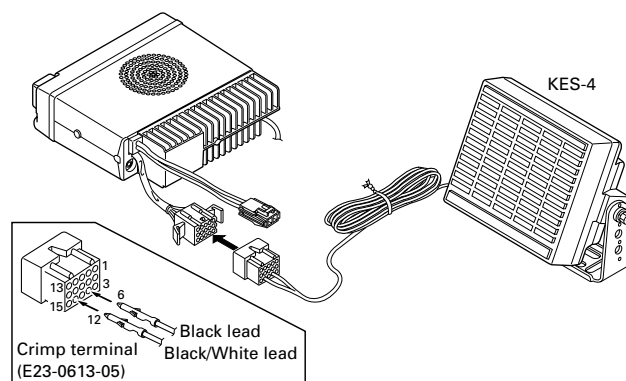


Fig. 16

CIRCUIT DESCRIPTION

Frequency Configuration

The receiver utilizes double conversion. The first IF is 49.95MHz and the second IF is 450kHz. The first local oscillator signal is supplied from the PLL circuit.

The PLL circuit in the transmitter generates the necessary frequencies. Figure 1 shows the frequencies.

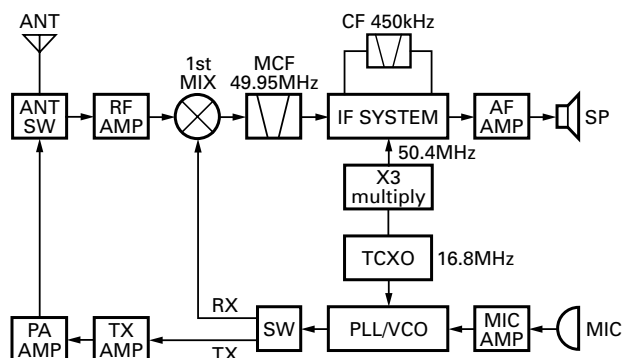


Fig. 1 Frequency configuration

Receiver System

The receiver is double conversion superheterodyne. The frequency configuration is shown in Figure 1.

■ Front-end RF Amplifier

An incoming signal from the antenna is applied to an RF amplifier (Q34) after passing through a transmit/receive switch circuit (D33 and D34 are off) and a BPF (L22 : two-pole helical resonators). After the signal is amplified (Q34), the signal is filtered by a BPF (L13 : two-pole helical resonators) to eliminate unwanted signals before it is passed to the first mixer. Band pass filters (L22 and L13) have varactor diodes (D28, D31, D18 and D23).

The voltage of these diodes are controlled by to track the CPU (IC502) center frequency of the band pass filter. (See Fig. 2)

■ First Mixer

The signal from the RF amplifier is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (Q15) to create a 49.95MHz first intermediate frequency (1st IF) signal. The first IF signal is then fed through one pair of monolithic crystal filter (MCF : XF1) to further remove spurious signals.

■ IF Amplifier

The first IF signal is amplified by Q13, and the enters IC5 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within IC5 to create a 450kHz second IF signal. The second IF signal is then fed through a 450kHz ceramic filter (Narrow : CF1, Wide : CF2) to further eliminate unwanted signals before it is amplified and FM detected in IC5.

| Item | Rating |
|--------------------------|--|
| Nominal center frequency | 49.95MHz |
| Pass bandwidth | ± 5.0kHz or more at 3dB |
| 35dB stop bandwidth | ± 20.0kHz or less |
| Ripple | 1.0dB or less |
| Insertion loss | 5.0dB or less |
| Guaranteed attenuation | 80dB or more at fo±1MHz |
| | Spurious : 40dB or more within fo±1MHz |
| Terminal impedance | 350Ω±5% / 5.5pF±0.5pF |

Table 1 Crystal filter (L71-0551-25) : XF1

| Item | Rating |
|--------------------------|---------------------------------|
| Nominal center frequency | 450kHz |
| 6dB bandwidth | ± 4.5kHz or more |
| 50dB bandwidth | ± 10.0kHz or less |
| Ripple | 2.0dB or less |
| Insertion loss | 6.0dB or less |
| Guaranteed attenuation | 55.0dB or more within fo±100kHz |
| Terminal impedance | 2.0kΩ |

Table 2 Ceramic filter (L72-0994-05) : CF1

| Item | Rating |
|--------------------------|---------------------------------|
| Nominal center frequency | 450kHz |
| 6dB bandwidth | ± 6.0kHz or more |
| 50dB bandwidth | ± 12.5kHz or less |
| Ripple | 2.0dB or less |
| Insertion loss | 6.0dB or less |
| Guaranteed attenuation | 35.0dB or more within fo±100kHz |
| Terminal impedance | 2.0kΩ |

Table 3 Ceramic filter (L72-0993-05) : CF2

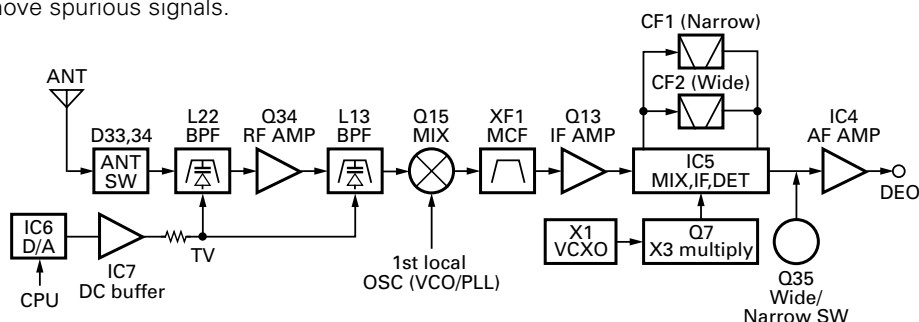


Fig. 2 Receiver system

CIRCUIT DESCRIPTION

Wide/Narrow Changeover Circuit

The W/N port (pin 4) of the shift register (IC510) is used to switch between ceramic filters. When the W/N port is high, Q4 turns on and the ceramic filter SW diode (D8, D10) CF1 turns on to receive a Narrow signal. At the same time, Q35 turns on and one of the filters is selected so that the wide and narrow audio output levels are equal.

When the W/N port is low, Q3 turns on and the ceramic filter SW diode (D8, D10) CF2 turns on to receive a Wide signal.

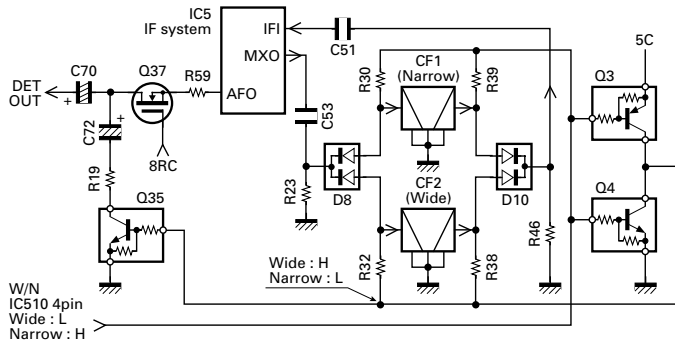


Fig. 3 Wide/Narrow changeover circuit

AF Signal System

The detection signal (DEO) from the TX-RX unit (A/2) goes to the audio processor (IC508) of the TX-RX unit (B/2). The signal passes through a filter in the audio processor to adjust the gain, and is output to IC507. IC507 sums the AF signal and the DTMF signal, BEEP signal and returns the resulting signal to the TX-RX unit. The signal (AFO) sent to the TX-RX unit (A/2) is input to the D/A converter (IC6). The AFO output level is adjusted by the D/A converter. The signal output from the D/A converter is input to the audio power amplifier (IC13). The AF signal from IC13 switches between the internal speaker and speaker jack (J1) output.

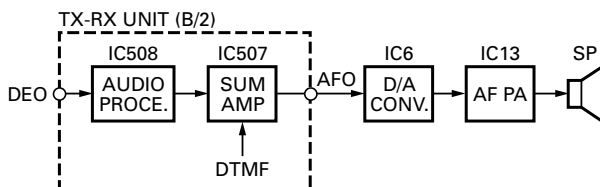


Fig. 4 AF signal system

Squelch Circuit

The detection output from the FM IF IC (IC5) passes through a band-pass filter and a noise amplifier (Q10) in the TX-RX unit (B/2) to detect noise. A voltage is applied to the CPU (IC502). The CPU controls squelch according to the voltage (ASQ) level. The signal from the RSSI pin of IC5 is monitored. The electric field strength of the receive signal can be known before the ASQ voltage is input to the CPU, and the scan stop speed is improved.

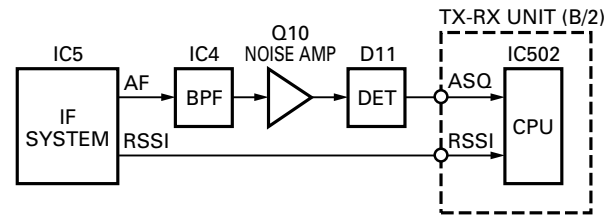


Fig. 5 Squelch circuit

PLL Frequency Synthesizer

The PLL circuit generates the first local oscillator signal for reception and the RF signal for transmission.

PLL

The VCO output is doubled by Q9 and then sent to the PLL IC (IC3). The frequency step of the PLL circuit is 10 or 12.5kHz. A 16.8MHz reference oscillator signal is divided at IC3 by a fixed counter to produce the 10 or 12.5kHz reference frequency. The voltage controlled oscillator (VCO) output signal is buffer amplified by Q106 (Sub-unit), then divided in IC3 by a dual-module programmable counter. The divided signal is compared in phase with the 10 or 12.5kHz reference signal in the phase comparator in IC3. The output signal from the phase comparator is filtered through a low-pass filter and passed to the VCO to control the oscillator frequency. (See Fig. 6)

VCO

The TK-863G has VCO in a Sub-unit (A1) housed in a solid shielded case and connected to the TX-RX unit (A/2) through CN101.

The operating frequency is generated by Q103 in transmit mode and Q101 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator, to the varactor diodes (D102 and D104 in transmit mode and D101 and D103 in receive mode). The RX (ST) pin is set low in receive mode causing Q102 to turn Q103 off, and turn Q101 on. The RX (ST) pin is set low in transmit mode. The outputs from Q101 and Q103 are amplified by Q106 and sent to the buffer amplifiers.

CIRCUIT DESCRIPTION

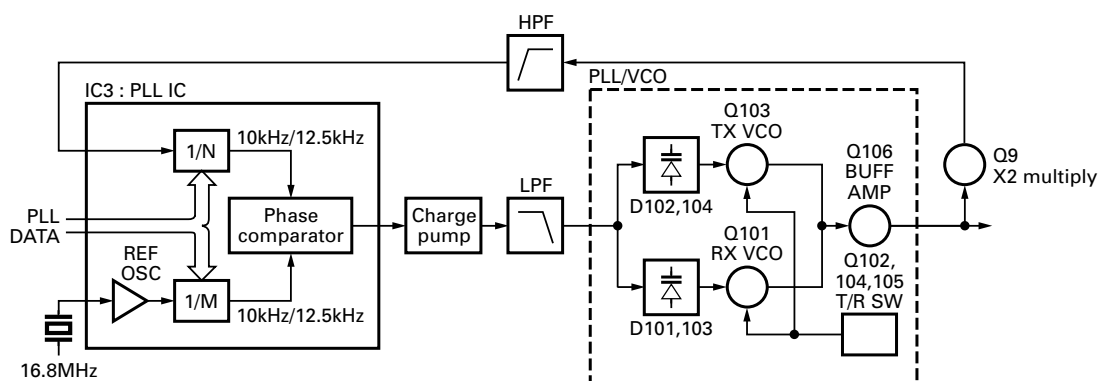


Fig. 6 PLL circuit

■ Unlock Circuit

During reception, the 8RC signal goes high, the 8TC signal goes low, and Q16 turns on. Q18 turns on and a voltage is applied to the collector (8R). During transmission, the 8RC signal goes low, the 8TC signal goes high and Q29 turns on. Q28 turns on and a voltage is applied to 8T.

The CPU in the TX-RX unit (B/2) monitors the PLL (IC3) LD signal directly. When the PLL is unlocked during transmission, the PLL LD signal goes low. The CPU detects this signal and makes the 8TC signal low. When the 8TC signal goes low, no voltage is applied to 8T, and no signal is transmitted.

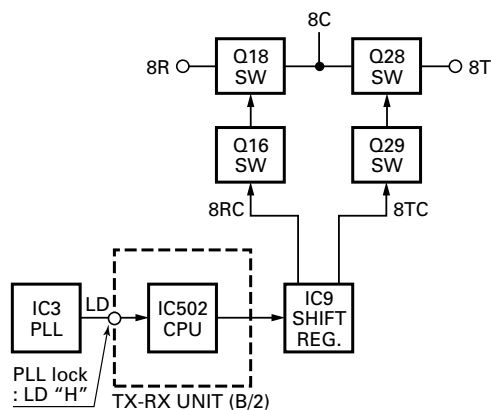


Fig. 7 Unlock circuit

Transmitter System

■ Outline

The transmitter circuit produces and amplifies the desired frequency directly. It FM-modulates the carrier signal by means of a varicap diode.

■ Power Amplifier Circuit

The transmit output signal from the VCO is amplified to a specified level of the power module (IC400) by the drive block (Q22, Q25 and Q27). The amplified signal passes through the transmission/reception selection diode (D16) and goes to a low-pass filter. The low-pass filter removes unwanted high-frequency harmonic components, and the resulting signal is sent to the antenna terminal.

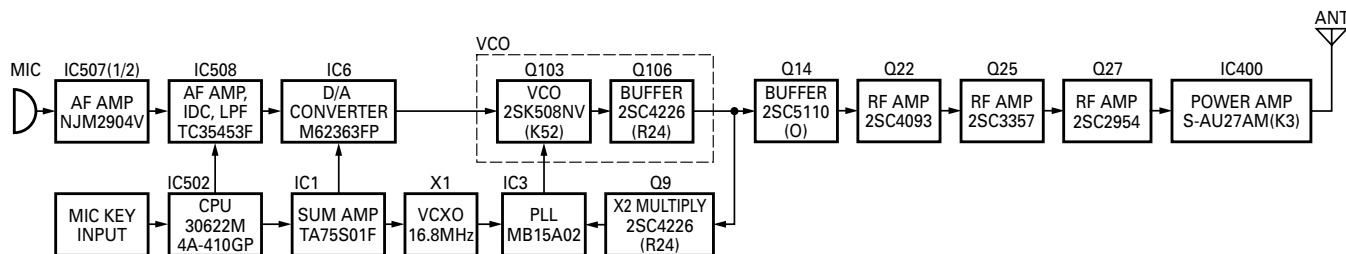


Fig. 8 Transmitter system

CIRCUIT DESCRIPTION

■ APC Circuit

The automatic transmission power control (APC) circuit detects part of a power module output with a diode (D35, D36) and applies a voltage to IC15. IC15 compares the APC control voltage (PC) generated by the D/A converter (IC6) and DC amplifier (IC7) with the detection output voltage to control Q31 and Q32, generates DB voltage from B voltage, and stabilizes transmission output.

The APC circuit is configured to protect over current of the power module due to fluctuations of the load at the antenna end and to stabilize transmission output at voltage and temperature variations.

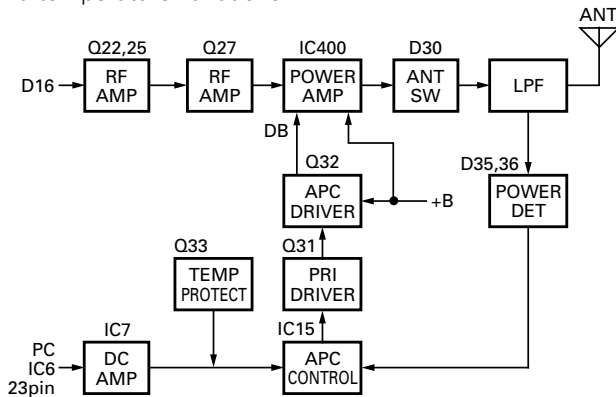


Fig. 9 APC circuit

Control Circuit

The CPU carries out the following tasks:

- 1) Controls the shift register (IC9, IC510) AF MUTE, WIDE/NARROW, T/R KEY outputs.
- 2) Adjusts the AF signal level of the audio processor (IC508) and turns the filter select compounder on or off.
- 3) Controls the DTMF decoder (IC511).
- 4) Controls the LCD assembly display data.
- 5) Controls the PLL (IC3).
- 6) Controls the D/A converter (IC6) and adjusts the volume, modulation and transmission power.

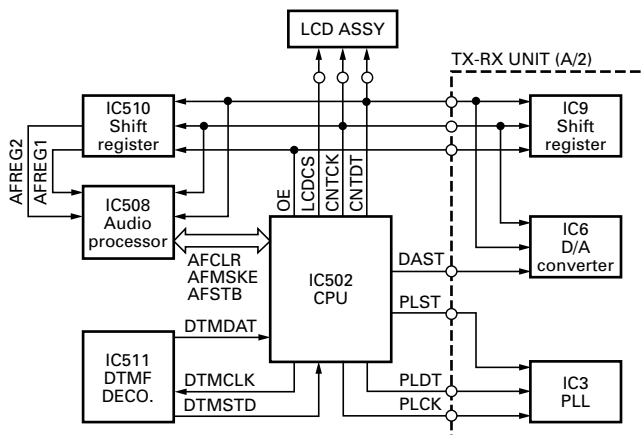


Fig. 10 Control circuit

■ Memory Circuit

The transceiver has a 2M-bit (256k x 8) flash ROM (IC501) and an 8k-bit EEPROM (IC505). The flash ROM contains firmware programs, data and user data which is programmed with the FPU. The EEPROM contains adjustment data. The CPU (IC502) controls the flash ROM through an external address bus and an external data bus. The CPU controls the EEPROM through two serial data lines.

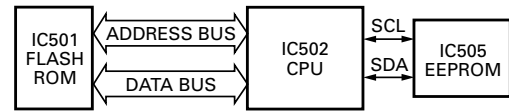


Fig. 11 Memory circuit

■ Display Circuit

The CPU (IC502) controls the shift register (IC510) and display LEDs. When the LED1 line goes high when the transceiver is busy, Q508 turns on and the green LED on D521 lights. In transmit mode, the LED0 line goes high, Q504 turns on and the red light lights. Backlighting LEDs for the key operation unit (D509~D514) and LCD are provided.

When the MBL line goes high, Q506 turns on, then Q505 turns on, and the key illumination LED lights. A voltage is applied to the MBL line to turn on the LCD backlight.

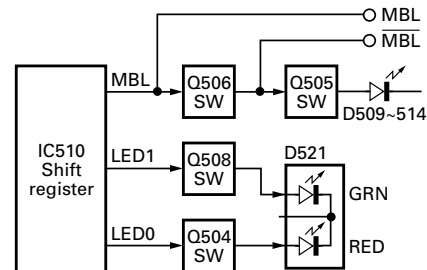


Fig. 12 Display circuit

■ Key Matrix Circuit

The TK-8603G front panel has function keys. Each of them is connected to a cross point of a matrix of the KIN0 to KOUT2 ports of the microprocessor. The KOUT0 to KOUT2 ports are always high, while the KIN0 to KIN2 ports are always low.

The microprocessor monitors the status of the KIN0 to KOUT2 ports. If the state of one of the ports changes, the microprocessor assumes that the key at the matrix point corresponding to that port has been pressed.

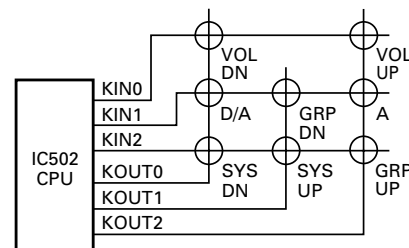


Fig. 13 Key matrix circuit

CIRCUIT DESCRIPTION

■ Encode

The LTR, QT and DQT signals are output from TO of the CPU (IC502) and summed with the external pin DI line by the summing amplifier (IC2) and the resulting signal goes to the D/A converter (IC6) of the TX-RX unit (A/2). The DTMF signal is output from DTMF of the CPU and goes to the audio processor (IC508). The signal is summed with a MIC signal by the audio processor (IC508), and the resulting signal passes through an analog switch (IC509) and goes to the TX-RX unit (A/2) (MO).

The D/A converter (IC6) adjusts the MO level and the balance between the MO and TO levels. Part of a TO signal is summed with MO and the resulting signal goes to the MD pin of the VCO. This signal is applied to a varicap diode in the VCO for direct FM modulation.

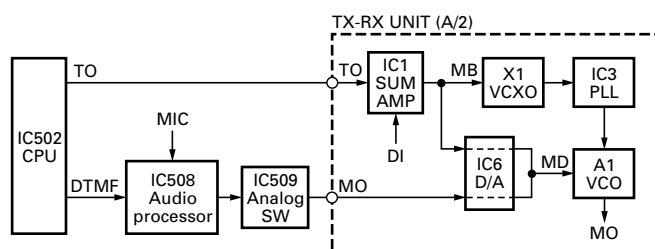


Fig. 14 Encode

■ Decode

• QT/DQT/LTR

The signal (DEO) detected by the TX-RX unit (B/2) passes through two low-pass filters of IC513, goes to TOI of the CPU (IC502) to decode QT, DQT and LTR.

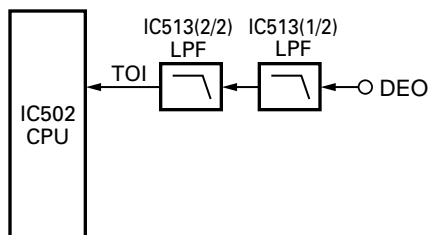


Fig. 15 Decode

■ D/A Converter

The D/A converter (IC6) is used to adjust TONE and MO modulation, AF volume, TV voltage, FC reference voltage, and PC power control voltage level.

Adjustment values are sent from the CPU as serial data. The D/A converter has a resolution of 256 and the following relationship is valid:

$$\text{D/A output} = (\text{Vin} - \text{VDAREF}) / 256 \times n + \text{VDAREF}$$

Vin: Analog input

VDAREF: D/A reference voltage

n: Serial data value from the microprocessor (CPU)

Power Supply Circuit

When the POWER switch on the TX-RX unit (B/2) is pressed, the PSW signal goes low. This signal is inverted by Q26 and sent to a flip-flop IC (IC14). This IC outputs a control signal when the PSW goes low. When the power turns on, pin 1 of IC14 outputs a low signal and Q20 turns on. The base of Q19 goes high, Q19 turns on, SB SW (Q23) turns on and power (SB) is supplied to the set.

This circuit has an overvoltage protection circuit. If a DC voltage of 20 V or higher is applied to the power cable, D21 turns on and a voltage is applied to the base of Q21. This voltage turns Q21 on and turns Q19 and SBSW off.

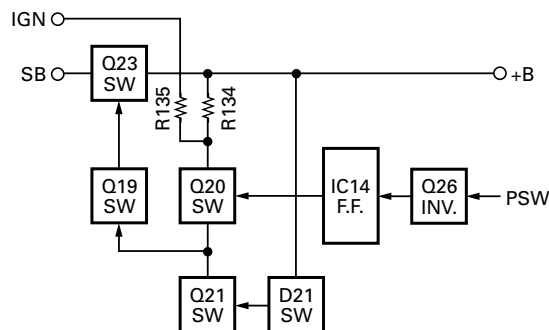


Fig. 16 Power supply circuit

SEMICONDUCTOR DATA

Microprocessor : 30622M4A-410GP (TX-RX Unit IC502)

■ Terminal function

| Pin No. | Name | I/O | Function | Pin No. | Name | I/O | Function |
|---------|---------|-----|--|---------|-----------|-----|---|
| 1 | EMGT | O | External MIC control. Mobile MIC : H | 39 | HOLD | I | Not used. |
| 2 | DTMF | O | DTMF/BEEP output. | 40,41 | NC | – | NC. |
| 3 | 2TN | – | Not used. | 42 | RD | O | READ signal. |
| 4 | DTMSTD | I | DTMF decode detect. Detect : H | 43 | NC | – | NC. |
| 5 | SIM | I | Destination select. | 44 | WR | O | WRITE signal. |
| 6 | BYTE | I | +5V (5C). | 45 | LCDCS | O | LCD chip enable output. |
| 7 | CNVSS | I | GND. | 46 | CNTDAT | O | Common data output. (LCD, SHIFT REG, VOL, Audio processor) |
| 8 | AFSTB | O | Base band IC strobe/reset output. | 47 | CNTCLK | O | Common clock output. (EEPROM, LCD, SHIFT REG, VOL, Audio processor) |
| 9 | AFFCLK | O | Base band IC frame detect reset/ system reset output. | 48 | CSO | – | Chip select signal. |
| 10 | RESET | I | Reset. | 49 | A19 | – | Not used. |
| 11 | XOUT | O | Clock output. | 50~59 | A18~A9 | – | Flash memory address bus. |
| 12 | VSS | – | GND. | 60 | ACC | – | +5V. |
| 13 | XIN | I | Clock input. | 61 | A8 | – | Flash memory address bus. |
| 14 | VCC | – | +5V. | 62 | VSS | – | GND. |
| 15 | NC | I | Pull up. | 63~70 | A7~A0 | – | Flash memory address bus. |
| 16 | MICDAT | I/O | MIC data input/output. | 71~73 | KIN0~KIN2 | I | Key scan input. |
| 17 | AUX3 | O | Squelch detect output. | 74 | MON | I | [MON] key input. On : L |
| 18 | NC | – | NC. | 75 | SCN | I | [SCN] key input. On : L |
| 19 | OE | I | Output enable control sift register. | 76 | PLLUL | I | PLL unlock detect input. Unlock : L |
| 20 | NC | – | NC. | 77 | PLLSTB | O | PLL strobe output. Latch : H |
| 21 | EEPDAT | I/O | EEPROM data input/output. | 78 | MUTE | I | RX audio mute. Mute : H |
| 22 | TO | O | QT/DQT/LTR modulation output. | 79~86 | D7~D0 | – | Flash memory data bus. |
| 23 | AUX1 | I | External PTT input. | 87 | PWR (EMG) | I | [PWR] key input (key interrupt). On : L |
| 24 | SFTSTB1 | O | Shift register strobe output. | 88 | EMG/TXS | I | Emergency input (key interrupt). On : L |
| 25 | DACSTB | O | D/A converter enable output. | 89 | RFDAT | O | PLL data output. |
| 26 | PTT | I | PTT. PTT on : L | 90 | RFCLK | O | PLL clock output. |
| 27,28 | NC | – | NC. | 91 | NC | – | NC. |
| 29 | AUX4 | O | | 92 | RSSQL | I | Receive signal strength indicator input. |
| 30 | AUX2 | I/O | | 93 | ANLSQL | I | Analog squelch level input. |
| 31 | PA | O | MIC audio line sw control. PA : H | 94 | AVSS | – | GND. |
| 32 | KOUT2 | O | Key scan output 2. | 95 | TOI | I | QT/DQT/LTR signal input. |
| 33 | TXD | O | Serial data. PTT on : L | 96 | VREF | – | Reference voltage input. |
| 34 | HOOK | I | HOOK/RXD. On hook : L | 97 | AVCC | – | +5V. |
| 35 | KOUT1 | O | Key scan output 1. | 98 | DTMPD | – | Not used. |
| 36 | KOUT0 | O | Key scan output 0. | 99 | DTMCLK | – | Not used. |
| 37 | RDY | I | Pull up. | 100 | DTMDAT | – | Not used. |
| 38 | NC | – | NC. | | | | |

SEMICONDUCTOR DATA / DESCRIPTION OF COMPONENTS

Shift Register : BU4094BCFV

■ Terminal function (TX-RX unit IC510)

| Pin No. | Port | Name | Function |
|---------|------|--------|--|
| 4 | Q1 | W/N | Wide/Narrow SW. Narrow : H |
| 5 | Q2 | MUTE | MIC mute (M models only). Mute : H |
| 6 | Q3 | MBL | MIC/LCD backlight control. Backlight on : H |
| 7 | Q4 | LED0 | Red LED. LED lights : H |
| 11 | Q8 | BSHIFT | Beat shift. Shift on : H |
| 12 | Q7 | AFREG2 | Base band IC inter register select 2. |
| 13 | Q6 | AFREG1 | Base band IC inter register select 1. |
| 14 | Q5 | LED1 | Green LED. LED lights : H |

■ Terminal function (TX-RX unit IC9)

| Pin No. | Port | Name | Function |
|---------|------|--------|---------------------------------------|
| 4 | Q1 | HNC | Horn alert control. Horn alert on : H |
| 5 | Q2 | 8RC | 8R control. RX : H |
| 6 | Q3 | 8TC | 8T control. TX : H |
| 7 | Q4 | SPMUTE | Speaker mute control. Mute on : H |
| 11 | Q8 | AUX6 | Auxiliary output. |
| 12 | Q7 | AUX5 | |
| 13 | Q6 | PA/LI | PA/LIGHT control. PA/LIGHT on : H |
| 14 | Q5 | RX | TX/RX VCO switch. RX : L |

DESCRIPTION OF COMPONENTS

Display Unit (X54-3270-10)

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------------------|---------------------|
| D801 | Reverse current prevention | |
| D802~805 | Light emission | |
| D808 | Current stability | |
| IC801 | LCD driver | |
| Q801 | DC switch (LED) | |

TX-RX Unit (X57-6490-10)

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------------------|---------------------|
| D1 | Surge absorption | |
| D2 | Voltage reference | |
| D3~5 | Surge absorption | |
| D8 | IF switch (Wide/Narrow) | |
| D9 | DC switch | |
| D10 | IF switch (Wide/Narrow) | |
| D11 | Noise amp detect | |
| D14 | Surge absorption | |
| D15 | OR gate | SP mute, AM |
| D16 | RF switch (TX/RX) | Heterodyne |
| D17 | Temperature compensation | Drive |
| D18 | RF BPF tuning | |
| D19 | Surge absorption | |
| D20 | Reverse current prevention | |
| D21 | Voltage reference | |
| D23 | RF BPF tuning | |
| D24 | Voltage reference | |
| D25 | Surge absorption | |
| D26 | Reverse current prevention | |
| D27 | Reverse current prevention | |
| D28 | RF BPF tuning | |
| D30 | ANT switch | |
| D31 | RF BPF tuning | |

DESCRIPTION OF COMPONENTS

| Ref. No. | Use/Function | Operation/Condition | Ref. No. | Use/Function | Operation/Condition |
|----------|----------------------------|--|----------|------------------------------------|---|
| D33,34 | ANT switch | | IC9 | Shift/Store register | HNC, 8RC, 8TC, SPMUTE, RX, PA/LI, AUX5, AUX6 |
| D35,36 | APC voltage detect | | IC10 | 5V AVR | 5C (TX/RX) |
| D39 | Voltage reference | Power protection | IC11 | 9V AVR | 9C |
| D40 | Charge | DEO | IC12 | 8V AVR | 8C |
| D41 | Temperature compensation | APC | IC13 | AF amplifier | |
| D42 | Voltage drop | Charge pump | IC14 | Power supply logic circuit control | |
| D54 | Discharge | | IC15 | DC amplifier | APC control |
| D501 | Reverse current prevention | KOUT 0 | IC400 | Power module | |
| D502 | Reverse current prevention | KOUT 1 | IC501 | Flash ROM | |
| D503 | Reverse current prevention | KOUT 2 | IC502 | CPU | |
| D504 | Reverse current prevention | KOUT 0 | IC503 | Reset IC | Low voltage output when powering up |
| D506 | Voltage discharger | When powering down | IC505 | EEPROM | |
| D507 | Reverse current prevention | KOUT 2 | IC507 | Amplifier | MIC, AFO |
| D508 | Limiter | MIC | IC508 | Audio processor | Compander, Mic amplifier, ALC, AF filter, IDC |
| D509~514 | Key backlight | Active while MBL is H | IC509 | Analog switch | MO, DEO, EMG, MI switch |
| D521 | Busy/TX LED | Lights green while busy, red while TX | IC510 | Shift/Store register | W/N, MM2, MBL, LED0, LED1, AFREG1, AFREG2, BSHIFT |
| D523 | OR gate | MIC mute, MM, MM2 | IC512 | 5V AVR | 5C (Control) |
| D524 | Surge absorption | HOOK/RXD | IC513 | Amplifier | QT/DQT decode |
| D525 | Surge absorption | PTT/TXD | Q1 | DC switch | HOR |
| D526 | Current protection | | Q2 | DC switch | 5S |
| D527 | Surge absorption | CM | Q3 | DC switch (W/N) | Active when narrow is selected |
| D528 | Surge absorption | MBL | Q4 | DC switch (W/N) | Active when wide is selected |
| D529 | Limiter | QT/DQT decode limiter | Q5 | DC switch | HNC |
| IC1 | Sum amplifier | DI, TO mixing | Q6 | DC switch | IGN |
| IC2 | DC amplifier | FC, TCXO control | Q7 | Buffer amplifier | 16.8MHz x 3 |
| IC3 | PLL synthesizer | Reference 16.8MHz, PLL lock : LD H | Q8 | Lipple filter | 8CL |
| IC4 | Amplifier | DEO | Q9 | Buffer amplifier | PLL f in, X2 multiply |
| IC5 | AF demodulation | Quadrature detector, 2nd mixer, OSC, IF amplifiler, RSSI | Q10 | Noise amplifier | Squelch |
| IC6 | D/A converter | | Q11 | Charge pump | øP |
| IC7 | DC amplifier | PC/TV control | Q12 | Charge pump | øR |
| | | | Q13 | IF amplifier | 49.95MHz |
| | | | Q14 | Buffer amplifier | Heterodyne |
| | | | Q15 | Mixer | |
| | | | Q16 | DC switch | 8R cont, On at RX |

DESCRIPTION OF COMPONENTS


| Ref. No. | Use/Function | Operation/Condition |
|----------|--------------------|--|
| Q17 | AF mute | Active while AF mute is active |
| Q18 | DC switch | 8R, active while RX |
| Q19,20 | DC switch | SB switch, active when power up |
| Q21 | DC switch | Active while PS voltage is more than 20V |
| Q22 | RF amplifier | |
| Q23 | DC switch | SB switch, active while power on |
| Q24 | AF mute | Active while power switch is off |
| Q25 | RF amplifier | Predrive |
| Q26 | Inverter | Active while power switch is low |
| Q27 | RF amplifier | Drive |
| Q28 | DC switch | 8T, active on TX |
| Q29 | DC switch | 8T cont, active on TX |
| Q31 | APC controller | |
| Q32 | APC controller | DB |
| Q33 | APC controller | Power protection |
| Q34 | L.N.A. | |
| Q35 | W/N switch | Active on narrow |
| Q36 | DC switch | Power protection |
| Q37 | AF mute switch | Inactive on mute |
| Q38 | DC switch | 5S |
| Q501 | Clock switch shift | Clock shift is active while BSHIFT is H |
| Q502 | AF mute | Active while MUTE is H |

| Ref. No. | Use/Function | Operation/Condition |
|----------|----------------------|---|
| Q503 | Inverter | Active while PA2 is H, public address is active |
| Q504 | LED switch (Red) | Active while LED0 is H, TX is active |
| Q505,506 | Key backlight switch | Active while MBL is H |
| Q508 | LED switch (Green) | Active while LED1 is H, RX is active |
| Q509 | MIC mute | Active while MM is H and MM2 is H |

PLL/VCO (X58-4670-17)

| Ref. No. | Use/Function | Operation/Condition |
|----------|-------------------|--------------------------|
| D101 | RX VCO | |
| D102 | TX VCO | |
| D103 | RX VCO | |
| D104 | TX VCO | |
| D105 | Modulation | |
| Q101 | Oscillator | RX |
| Q102 | Inverter | Active while ST is H |
| Q103 | Oscillator | TX |
| Q104 | TX/RX switch (TX) | Active while ST is H |
| Q105 | TX/RX switch (RX) | Active while Q102 is off |
| Q106 | Buffer amplifier | |

PARTS LIST

* New Parts.  indicates safety critical components.

Parts without **Parts No.** are not supplied.

Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

L : Scandinavia

V : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

TK-863G

DISPLAY UNIT (X54-3270-10)

TX-RX UNIT (X57-6490-10)

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|-----------------------------------|----------|-----------|---------------|--------------------------------|-------------|
| TK-863G | | | | | |
| 1 | 1B | | A01-2165-23 | CABINET (UPPER) | |
| 2 | 2A | | A01-2166-23 | CABINET (BOTTOM) | |
| 3 | 2A | | A62-0642-03 | PANEL ASSY | |
| 5 | 1D | | B09-0235-05 | CAP ACCESSORY | |
| 6 | 2B | | B11-1226-03 | ILLUMINATION GUIDE | |
| 7 | 2A | | B38-0868-05 | LCD | |
| 8 | 2D | | B62-1577-00 | INSTRUCTION MANUAL | |
| 9 | 1C | | B72-2025-04 | MODEL NAME PLATE | |
| 11 | 2B | | E29-1179-04 | INTER CONNECTOR | |
| 12 | 1C | | E30-2145-15 | ANTENNA CABLE | |
| 13 | 1D | | E30-3339-05 | DC CORD ACCESSORY | |
| 14 | 1C | | E30-3340-05 | DC CORD (RADIO) | |
| - | - | | E30-3404-05 | TRUNK CABLE | |
| 16 | 1C | | E37-0790-25 | SPEAKER CABLE | |
| 17 | 2B | | E37-0815-05 | FLAT CABLE | |
| - | - | | F10-2280-12 | SHIELDING COVER | |
| 18 | 2B | | F12-0435-04 | CONDUCTIVE SHEET | |
| 19 | 1D | | F51-0016-05 | FUSE (6*30) 10A | |
| 20 | 1C | | G02-0791-04 | FLAT SPRING (AF,APC) | |
| 21 | 1B | | G02-0841-14 | FLAT SPRING (BPF) | |
| 22 | 1B,1C | | G10-1221-04 | FIBROUS SHEET (SIDE) | |
| 23 | 1B | | G10-1222-14 | FIBROUS SHEET (UP,DOWN) | |
| 24 | 1A,2A,2C | | G10-1223-14 | FIBROUS SHEET (CABINET) | |
| 25 | 1C | | G13-1468-04 | CUSHION (DC CORD) | |
| 26 | 1B | | G13-1759-04 | CUSHION (SPEAKER) | |
| 27 | 2C | | G53-0796-04 | PACKING (PHONE JACK) | |
| 30 | 3D | | H10-6618-12 | POLYSTYRENE FOAMED FIXTURE (F) | |
| 31 | 2E | | H10-6619-12 | POLYSTYRENE FOAMED FIXTURE (R) | |
| 32 | 1D | | H12-1391-03 | INNER PACKING CASE | |
| 33 | 1E,2E | | H25-0720-04 | PROTECTION BAG (200X350) | |
| 34 | 3E | | H52-1519-02 | ITEM CARTON CASE | |
| 36 | 2D | | J19-1584-05 | MIC HOLDER ACCESSORY | |
| 37 | 2A | | J21-8382-03 | HARDWARE FIXTURE | |
| 38 | 1D | | J29-0627-23 | BRACKET ACCESSORY | |
| 40 | 2A | | K29-9140-02 | KEY TOP | |
| A | 2A,1B | | N33-2606-45 | OVAL HEAD MACHINE SCREW | |
| B | 2C | | N67-3008-46 | PAN HEAD SEMS SCREW W | |
| C | 2B,1C | | N87-2606-46 | BRAZIER HEAD TAPTITE SCREW | |
| D | 2B | | N87-2612-46 | BRAZIER HEAD TAPTITE SCREW | |
| 42 | 2D | | N99-0395-05 | SCREW SET ACCESSORY | |
| 44 | 1B | | T07-0368-05 | SPEAKER | |
| 45 | 1D | | T91-0621-05 | MICROPHONE ACCESSORY | |
| DISPLAY UNIT (X54-3270-10) | | | | | |
| D802-805 | | * | B30-2220-05 | LED (YELLOW) | |
| C801-803 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C804 | | | CK73GF1A105Z | CHIP C 1.0UF Z | |
| C805 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C806,807 | | | CK73GB1H471K | CHIP C 470PF K | |
| CN801 | | | E40-6020-05 | PIN ASSY | |

| Ref. No. | Address | New parts | Parts No. | Description | Destination |
|---------------------------------|---------|-----------|---------------|----------------------|-------------|
| L801 | | | L92-0138-05 | FERRITE CHIP | |
| R801-803 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R804 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R805 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| R806 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R808 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | |
| R809 | | | RK73FB2A270J | CHIP R 27 J 1/10W | |
| D801 | | | MA2S111 | DIODE | |
| D808 | | | DA204U | DIODE | |
| IC801 | | | LC75823W | MOS IC | |
| Q801 | | | 2SB1132(Q,R) | TRANSISTOR | |
| TX-RX UNIT (X57-6490-10) | | | | | |
| D509-514 | | | B30-2050-05 | LED | |
| D521 | | | B30-2151-05 | LED (RED/GREEN) | |
| C1-11 | | | CK73GB1H471K | CHIP C 470PF K | |
| C13-19 | | | CK73GB1H471K | CHIP C 470PF K | |
| C20 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C21 | | | CK73GB1H471K | CHIP C 470PF K | |
| C22 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C23,24 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C25 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C26 | | | CK73GB1H471K | CHIP C 470PF K | |
| C28 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C29 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C30 | | | CC73GCH1H020B | CHIP C 2.0PF B | |
| C31 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C32 | | | C92-0662-05 | CHIP-TAN 15UF 6.3WV | |
| C33 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C34 | | | CK73GB1A105K | CHIP C 1.0UF K | |
| C35 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C36 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C37 | | | CK73FB1C334K | CHIP C 0.33UF K | |
| C39 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C40 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C41 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C43 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C44 | | | CK73GB1H331K | CHIP C 330PF K | |
| C45 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C46 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C47 | | | C92-0561-05 | CHIP-ELE 22UF 16WV | |
| C49 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C51 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C52 | | | CC73GCH1H680J | CHIP C 68PF J | |
| C53 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C54 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C55 | | | CC73GCH1H010B | CHIP C 1.0PF B | |
| C56 | | | CC73GCH1H220J | CHIP C 22PF J | |
| C58 | | | CK73GB1E223K | CHIP C 0.022UF K | |
| C60 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C61 | | | CC73GCH1H050C | CHIP C 5.0PF C | |
| C62 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C63 | | | CK73GB1C104K | CHIP C 0.10UF K | |

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| C64 | | | CK73GB1H103K | CHIP C 0.010UF K | | C135 | | | CK73GB1H471K | CHIP C 470PF K | |
| C66 | | | CK73GB1H102K | CHIP C 1000PF K | | C138 | | | CK73FB1E104K | CHIP C 0.10UF K | |
| C67 | | | CK73GB1H471K | CHIP C 470PF K | | C139,140 | | | CK73GB1H471K | CHIP C 470PF K | |
| C68 | | | CC73GCH1H101J | CHIP C 100PF J | | C141 | | | C92-0719-05 | ELECTRO 47UF 25WV | |
| C69 | | | CK73GB1C104K | CHIP C 0.10UF K | | C142,143 | | | CK73GB1H471K | CHIP C 470PF K | |
| C70 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | C144 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C71 | | | CC73GCH1H101J | CHIP C 100PF J | | C145 | | | CC73GCH1H070D | CHIP C 7.0PF D | |
| C72 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | C146 | | | CK73GB1H471K | CHIP C 470PF K | |
| C73 | | | CC73GCH1H101J | CHIP C 100PF J | | C148,149 | | | CK73GB1H471K | CHIP C 470PF K | |
| C74,75 | | | CK73GB1H471K | CHIP C 470PF K | | C150 | | | CK73FF1C105Z | CHIP C 1.0UF Z | |
| C77 | | | C92-0561-05 | CHIP-ELE 22UF 16WV | | C152 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C78 | | | CK73GB1C104K | CHIP C 0.10UF K | | C153 | | | CC73GCH1H040C | CHIP C 4.0PF C | |
| C79,80 | | | CK73GB1H102K | CHIP C 1000PF K | | C154 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C81 | | | CK73GB1H471K | CHIP C 470PF K | | C155 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C82 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | C156 | | | CK73GB1H471K | CHIP C 470PF K | |
| C83 | | | CC73GCH1H270J | CHIP C 27PF J | | C157 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C84 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | C158 | | | CK73GB1H471K | CHIP C 470PF K | |
| C86 | | | C92-0662-05 | CHIP-TAN 15UF 6.3WV | | C160,161 | | | C92-0719-05 | ELECTRO 47UF 25WV | |
| C87 | | | CC73GCH1H330J | CHIP C 33PF J | | C162,163 | | | CK73GB1H471K | CHIP C 470PF K | |
| C88 | | | CK73GB1H103K | CHIP C 0.010UF K | | C164 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C89 | | | CK73GB1H471K | CHIP C 470PF K | | C165 | | | C92-0719-05 | ELECTRO 47UF 25WV | |
| C91 | | | CC73GCH1H020B | CHIP C 2.0PF B | | C166 | | | CE04EW1E471M | ELECTRO 470UF 25WV | |
| C92 | | | CK73GB1H471K | CHIP C 470PF K | | C167 | | | CK73GB1H471K | CHIP C 470PF K | |
| C93 | | | C92-0511-05 | CHIP-TAN 0.15UF 35WV | | C168 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C94-96 | | | CK73GB1H471K | CHIP C 470PF K | | C169 | | | CK73GB1H471K | CHIP C 470PF K | |
| C97 | | | C92-0546-05 | CHIP-TAN 68UF 6.3WV | | C172 | | | CE04EW1E471M | ELECTRO 470UF 25WV | |
| C98 | | | CK73GB1H103K | CHIP C 0.010UF K | | C173 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C99 | | | C92-0588-05 | CHIP-TAN 1.5UF 16V | | C174 | | | CK73GB1H471K | CHIP C 470PF K | |
| C100 | | | CC73GCH1H020B | CHIP C 2.0PF B | | C177 | | | CC73FCH1H220J | CHIP C 22PF J | |
| C101 | | | CK73GB1H471K | CHIP C 470PF K | | C178 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C102 | | | CC73GCH1H020B | CHIP C 2.0PF B | | C179 | | | CK73GB1H471K | CHIP C 470PF K | |
| C103 | | | CK73GB1H471K | CHIP C 470PF K | | C181,182 | | | CK73GB1H471K | CHIP C 470PF K | |
| C104 | | | C92-0001-05 | CHIP C 0.1UF 35WV | | C183 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C105 | | | CK73GB1H471K | CHIP C 470PF K | | C185 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C106 | | | CC73GCH1H180J | CHIP C 18PF J | | C186 | | | CK73GB1H471K | CHIP C 470PF K | |
| C107 | | | CK73GB1H471K | CHIP C 470PF K | | C187 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| C108 | | | CC73GCH1H020B | CHIP C 2.0PF B | | C189,190 | | | CK73GB1H471K | CHIP C 470PF K | |
| C109 | | | CK73GB1H471K | CHIP C 470PF K | | C191 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C110 | | | CC73GCH1H070D | CHIP C 7.0PF D | | C192 | | | C92-0719-05 | ELECTRO 47UF 25WV | |
| C111 | | | CC73GCH1H030C | CHIP C 3.0PF C | | C195 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C112 | | | CK73GB1H471K | CHIP C 470PF K | | C196,197 | | | CK73GB1H471K | CHIP C 470PF K | |
| C113 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | C198 | | | C92-0719-05 | ELECTRO 47UF 25WV | |
| C114 | | | C92-0697-05 | CHIP-TAN 3.3UF 16WV | | C201 | | | CK73GB1H471K | CHIP C 470PF K | |
| C115 | | | CK73GB1H471K | CHIP C 470PF K | | C202 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C116 | | | CK73GB1H103K | CHIP C 0.010UF K | | C203 | | | CK73GB1H471K | CHIP C 470PF K | |
| C117 | | | CK73GB1H102K | CHIP C 1000PF K | | C204 | | | C92-0004-05 | CHIP-TAN 1.0UF 16WV | |
| C118 | | | CK73GB1H471K | CHIP C 470PF K | | C206 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C119 | | | CK73GB1H103K | CHIP C 0.010UF K | | C207 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C120 | | | CC73GCH1H040C | CHIP C 4.0PF C | | C208 | | | CC73GCH1H050C | CHIP C 5.0PF C | |
| C121 | | | CK73GB1H471K | CHIP C 470PF K | | C209 | | | CC73FCH1H050C | CHIP C 5.0PF C | |
| C122,123 | | | CK73GB1C104K | CHIP C 0.10UF K | | C210 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C125 | | | C92-0005-05 | CHIP-TAN 2.2UF 6.3WV | | C211 | | | CC73GCH1H180J | CHIP C 18PF J | |
| C126 | | | CC73GCH1H120J | CHIP C 12PF J | | C212 | | | CK73GB1H471K | CHIP C 470PF K | |
| C127 | | | CK73GB1H103K | CHIP C 0.010UF K | | C215 | | | CC73FCH1H060D | CHIP C 6.0PF D | |
| C128 | | | C92-0543-05 | CHIP-TAN 3.3UF 10WV | | C216 | | | CC73GCH1H0R5B | CHIP C 0.5PF B | |
| C129 | | | CK73FF1C105Z | CHIP C 1.0UF Z | | C217 | | | CC73GCH1H020B | CHIP C 2.0PF B | |
| C130 | | | CK73GB1H103K | CHIP C 0.010UF K | | C218 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C131 | | | CK73GB1H102K | CHIP C 1000PF K | | C219 | | | CC73FCH1H040C | CHIP C 4.0PF C | |
| C133 | | | CK73GB1H471K | CHIP C 470PF K | | C220 | | | CK73GB1H471K | CHIP C 470PF K | |
| C134 | | | CK73FB1E104K | CHIP C 0.10UF K | | C221 | | | C93-0550-05 | CHIP C 1.0PF C | |

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|----------|---------|-----------|---------------|----------------------|--------------|----------|---------|-----------|---------------|----------------------|--------------|
| C222 | | | CC73GCH1H0R5B | CHIP C 0.5PF B | | C557 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C223 | | | CC73GCH1H020B | CHIP C 2.0PF B | | C558 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C224 | | | CK73GB1H471K | CHIP C 470PF K | | C559 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C225 | | | C93-0603-05 | CHIP C 1000PF K | | C560-563 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C226 | | | C93-0556-05 | CHIP C 6.0PF D | | C564 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C227 | | | C93-0558-05 | CHIP C 8.0PF D | | C565,566 | | | CK73GB1H472K | CHIP C 4700PF K | |
| C229 | | | C93-0556-05 | CHIP C 6.0PF D | | C567 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C230,231 | | | CK73GB1C104K | CHIP C 0.10UF K | | C568 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C241 | | | CK73GB1H471K | CHIP C 470PF K | | C569 | | | CK73GB1E223K | CHIP C 0.022UF K | |
| C248 | | | C92-0585-05 | CHIP-TAN 4.7UF 16WV | | C570 | | | CK73FF1C105Z | CHIP C 1.0UF Z | |
| C250 | | | CK73FF1C105Z | CHIP C 1.0UF Z | | C571,572 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C251 | | | CK73GB1H221K | CHIP C 220PF K | | C573 | | | CK73FB1H563K | CHIP C 0.056UF K | |
| C254 | | | CK73GB1C104K | CHIP C 0.10UF K | | C574 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C257 | | | CK73GB1C104K | CHIP C 0.10UF K | | C575 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C259 | | | CK73GB1C104K | CHIP C 0.10UF K | | C578 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C265 | | | CK73GB1H471K | CHIP C 470PF K | | C579 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C266 | | | CK73GB1A105K | CHIP C 1.0UF K | | C580 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C270 | | | CK73GB1H471K | CHIP C 470PF K | | C581 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C271 | | | CK73GB1H681K | CHIP C 680PF K | | C583 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | |
| C275 | | | CK73GB1H471K | CHIP C 470PF K | | C585 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C278 | | | CK73GB1H221K | CHIP C 220PF K | | C587 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C285 | | | CK73GB1H221K | CHIP C 220PF K | | C589 | | | C92-0606-05 | CHIP-TAN 4.7UF 10WV | |
| C292-294 | | | CK73GB1H471K | CHIP C 470PF K | | C590 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C298 | | | CC73GCH1H680J | CHIP C 68PF J | | C594 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C299 | | | CK73GB1H471K | CHIP C 470PF K | | C596 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C300 | | | CK73GB1A105K | CHIP C 1.0UF K | | C597 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C501 | | | CK73GB1H102K | CHIP C 1000PF K | | C598 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C502 | | | CK73GB1C104K | CHIP C 0.10UF K | | C599 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C503 | | | CK73GB1H471K | CHIP C 470PF K | | C600 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C504 | | | CK73GB1H103K | CHIP C 0.010UF K | | C601,602 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C505 | | | CK73GB1C104K | CHIP C 0.10UF K | | C603 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C506,507 | | | CK73GB1H103K | CHIP C 0.010UF K | | C604-606 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C508 | | | CK73GB1H472K | CHIP C 4700PF K | | C608-610 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C509 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | | C611,612 | | | CK73GB1H471K | CHIP C 470PF K | |
| C514 | | | CC73GCH1H680J | CHIP C 68PF J | | C613 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C515 | | | CK73GB1H103K | CHIP C 0.010UF K | | C615 | | | CK73GB1H471K | CHIP C 470PF K | |
| C516 | | | CC73GCH1H270J | CHIP C 27PF J | | C616 | | | CC73GCH1H101J | CHIP C 100PF J | |
| C517 | | | CK73GB1E153K | CHIP C 0.015UF K | | C618 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C518 | | | CC73GCH1H270J | CHIP C 27PF J | | C620 | | | CK73GB1H471K | CHIP C 470PF K | |
| C519 | | | CK73GB1H102K | CHIP C 1000PF K | | C621 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C523 | | | CC73GCH1H121J | CHIP C 120PF J | | C623 | | | CK73GB1H102K | CHIP C 1000PF K | |
| C525 | | | CK73GB1E123K | CHIP C 0.012UF K | | C626 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C526 | | | CK73GB1C683K | CHIP C 0.068UF K | | C628 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C527 | | | CK73GB1H222K | CHIP C 2200PF K | | C629 | | | CC73GCH1H470J | CHIP C 47PF J | |
| C530 | | | CK73GB1H152K | CHIP C 1500PF K | | C630 | | | C92-0507-05 | CHIP-TAN 4.7UF 6.3WV | |
| C533 | | | CK73GB1C104K | CHIP C 0.10UF K | | C631 | | | CK73GB1H103K | CHIP C 0.010UF K | |
| C534,535 | | | CK73GB1H103K | CHIP C 0.010UF K | | C632 | | | CK73FF1C105Z | CHIP C 1.0UF Z | |
| C536,537 | | | CK73GB1C104K | CHIP C 0.10UF K | | C633 | | | CK73GB1C104K | CHIP C 0.10UF K | |
| C538 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | | C720 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | |
| C539 | | | CK73GB1H103K | CHIP C 0.010UF K | | CN1 | | | E40-6047-05 | PIN ASSY | |
| C540,541 | | | CK73GB1C104K | CHIP C 0.10UF K | | CN2 | | | E40-6021-05 | FLAT CABLE CONNECTOR | |
| C542 | | | CC73GCH1H331J | CHIP C 330PF J | | CN3 | | | E40-3247-05 | PIN ASSY | |
| C543 | | | CK73GB1H102K | CHIP C 1000PF K | | CN4 | | | E40-5737-05 | PIN ASSY | |
| C544-546 | | | CK73GB1H562K | CHIP C 5600PF K | | CN5 | | | E40-5738-05 | PIN ASSY | |
| C548-550 | | | CK73GB1H272K | CHIP C 2700PF K | | CN7 | | | E40-3247-05 | PIN ASSY | |
| C551 | | | CC73GCH1H151J | CHIP C 150PF J | | CN8 | | | E40-3246-05 | PIN ASSY | |
| C553 | | | CK73GB1H102K | CHIP C 1000PF K | | CN501 | | | E40-6021-05 | FLAT CABLE CONNECTOR | |
| C554 | | | CK73GB1H122K | CHIP C 1200PF K | | J1 | | | E11-0442-05 | 3.5D PHONE JACK (3P) | |
| C555 | | | C92-0560-05 | CHIP-TAN 10UF 6.3WV | | J501 | | | E08-0877-05 | MODULAR JACK | |
| C556 | | | CK73GB1C333K | CHIP C 0.033UF K | | | | | | | |

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| F1 | | | F53-0108-05 | FUSE | | R14 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| - | | | J31-0543-05 | COLLAR | | R15 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| CF1 | | | L72-0959-05 | CERAMIC FILTER | | R16 | | | RK73GB1J220J | CHIP R 22 J 1/16W | |
| CF1 | | | L72-0994-05 | CERAMIC FILTER | | R17 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| CF2 | | | L72-0973-05 | CERAMIC FILTER | | R18 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| CF2 | | | L72-0993-05 | CERAMIC FILTER | | R19 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | |
| L1 | | | L40-1005-34 | SMALL FIXED INDUCTOR (10UH) | | R20 | | | RK73GB1J124J | CHIP R 120K J 1/16W | |
| L2-4 | | | L40-3381-86 | SMALL FIXED INDUCTOR (0.33UH) | | R21 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| L5 | | | L34-4530-05 | COIL | | R22 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| L6 | | | L40-8275-77 | SMALL FIXED INDUCTOR (82NH) | | R23 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| L7 | | | L40-5685-85 | SMALL FIXED INDUCTOR (0.56UH) | | R24 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| L8 | | | L40-8285-85 | SMALL FIXED INDUCTOR (0.82UH) | | R25 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| L9 | | | L40-1575-77 | SMALL FIXED INDUCTOR (15NH) | | R26 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| L10 | | | L40-2275-77 | SMALL FIXED INDUCTOR (22NH) | | R29 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| L11,12 | | | L40-1575-34 | SMALL FIXED INDUCTOR (15NH) | | R30 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| L13 | | | L79-1585-05 | HELICAL BLOCK | | R31 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | |
| L14 | | | L40-1875-77 | SMALL FIXED INDUCTOR (18NH) | | R32 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| L15 | | | L40-6875-77 | SMALL FIXED INDUCTOR (68NH) | | R33 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| L16 | | | L40-6875-34 | SMALL FIXED INDUCTOR (68NH) | | R34 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| L17 | | | L40-1275-77 | SMALL FIXED INDUCTOR (12NH) | | R35 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| L18 | | | L40-1075-34 | SMALL FIXED INDUCTOR (10NH) | | R36 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| L19 | | | L40-3375-77 | SMALL FIXED INDUCTOR (33NH) | | R37 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| L20 | | | L40-1875-77 | SMALL FIXED INDUCTOR (18NH) | | R38-40 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| L21 | | | L34-4478-05 | AIR-CORE COIL | | R41 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| L22 | | | L79-1585-05 | HELICAL BLOCK | | R42 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| L24 | | | L92-0179-05 | FERRITE CHIP | | R43 | | | RK73GB1J683J | CHIP R 68K J 1/16W | |
| L26 | | | L40-3375-34 | SMALL FIXED INDUCTOR (33NH) | | R44 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| L27 | | | L40-1575-34 | SMALL FIXED INDUCTOR (15NH) | | R46 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| L29 | | | L34-1185-05 | AIR-CORE COIL | | R47 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| L30,31 | | | L34-1039-05 | AIR-CORE COIL | | R48 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| L32 | | | L34-4478-05 | AIR-CORE COIL | | R49 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | |
| L33 | | | L92-0179-05 | FERRITE CHIP | | R50 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| L38,39 | | | L40-1075-77 | SMALL FIXED INDUCTOR (10NH) | | R51-53 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| L501 | | | L92-0138-05 | FERRITE CHIP | | R54 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| L503,504 | | | L92-0138-05 | FERRITE CHIP | | R56 | | | RK73GB1J100J | CHIP R 10 J 1/16W | |
| L510 | | | L92-0138-05 | FERRITE CHIP | | R57 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| X1 | | | L77-1881-05 | TCXO (16.8MHZ) | | R58 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| X501 | | | L78-0479-05 | RESONATOR (3.58MHZ) | | R59 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| X502 | | | L78-0462-05 | RESONATOR (9.8304MHZ) | | R60 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| XF1 | | | L71-0551-25 | MCF (49.95MHZ) | | R61 | | | RK73GB1J221J | CHIP R 220 J 1/16W | |
| CP501-505 | | | R90-0741-05 | MULTIPLE RESISTOR | | R62 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| CP508-514 | | | R90-0741-05 | MULTIPLE RESISTOR | | R63 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| CP516-524 | | | R90-0741-05 | MULTIPLE RESISTOR | | R64,65 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| CP526,527 | | | R90-0741-05 | MULTIPLE RESISTOR | | R66 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| CP529-531 | | | R90-0741-05 | MULTIPLE RESISTOR | | R67 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | |
| CP533-536 | | | R90-0741-05 | MULTIPLE RESISTOR | | R68 | | | RK73GB1J221J | CHIP R 220 J 1/16W | |
| CP538 | | | R90-0741-05 | MULTIPLE RESISTOR | | R69 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| CP539 | | | R90-0724-05 | MULTI-COMP 1K X4 | | R70 | | | RK73GB1J562J | CHIP R 5.6K J 1/16W | |
| R1 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R71 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| R2 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R72 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R3 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R75 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R4 | | | RK73GB1J333J | CHIP R 33K J 1/16W | | R76 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R6 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R77 | | | RK73GB1J224J | CHIP R 220K J 1/16W | |
| R7,8 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R78 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R9,10 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R79 | | | RK73GB1J681J | CHIP R 680 J 1/16W | |
| R11 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R80 | | | RK73GB1J471J | CHIP R 470 J 1/16W | |
| R12 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R81 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R13 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | R82 | | | RK73GB1J561J | CHIP R 560 J 1/16W | |
| | | | | | | R83 | | | RK73GB1J684J | CHIP R 680K J 1/16W | |
| | | | | | | R84 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |

PARTS LIST

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| R85,86 | | | RK73GB1J122J | CHIP R 1.2K J 1/16W | | R160 | | | RK73FB2A102J | CHIP R 1.0K J 1/10W | |
| R87 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R161,162 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R88 | | | RK73GB1J271J | CHIP R 270 J 1/16W | | R163 | | | R92-0670-05 | CHIP R 0 OHM | |
| R89 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R164 | | | R92-1215-05 | CHIP R 470 J 1/2W | |
| R90 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R166 | | | RK73GB1J151J | CHIP R 150 J 1/16W | |
| R91 | | | RK73GB1J823J | CHIP R 82K J 1/16W | | R169 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R92 | | | RK73GB1J822J | CHIP R 8.2K J 1/16W | | R170 | | | RK73FB2A222J | CHIP R 2.2K J 1/10W | |
| R93 | | | RK73GB1J821J | CHIP R 820 J 1/16W | | R171 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R94 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | | R172 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R95 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R173 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R97,98 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | R174 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R99 | | | RK73GB1J271J | CHIP R 270 J 1/16W | | R175 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | |
| R100,101 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | | R176 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R103 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | R177 | | | R92-1261-05 | CHIP R 150 J 1/2W | |
| R104 | | | RK73GB1J682J | CHIP R 6.8K J 1/16W | | R178 | | | RK73GB1J822J | CHIP R 8.2K J 1/16W | |
| R105 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | R179 | | | RK73GB1J223J | CHIP R 22K J 1/16W | |
| R106 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R180,181 | | | RK73GB1J562J | CHIP R 5.6K J 1/16W | |
| R107 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | R182 | | | R92-0670-05 | CHIP R 0 OHM | |
| R108 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | | R184 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R109 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R185 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R110 | | | RK73GB1J470J | CHIP R 47 J 1/16W | | R186 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R111 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | R187 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R112 | | | RK73GB1J471J | CHIP R 470 J 1/16W | | R188 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R113 | | | RK73GB1J100J | CHIP R 10 J 1/16W | | R189 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| R114 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | R190 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R115 | | | RK73GB1J563J | CHIP R 56K J 1/16W | | R192 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R116 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | R193 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R117 | | | RK73GB1J221J | CHIP R 220 J 1/16W | | R196 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | |
| R118 | | | RK73GB1J681J | CHIP R 680 J 1/16W | | R197 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R119 | | | RK73GB1J222J | CHIP R 2.2K J 1/16W | | R198 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R120 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R199-202 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R121 | | | RK73GB1J100J | CHIP R 10 J 1/16W | | R207 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R122 | | | R92-1215-05 | CHIP R 470 J 1/2W | | R208 | | | RK73GB1J100J | CHIP R 10 J 1/16W | |
| R123 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | R210 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R124 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R219 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R125 | | | RK73GB1J333J | CHIP R 33K J 1/16W | | R221 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R126 | | | RK73GB1J471J | CHIP R 470 J 1/16W | | R232 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R127,128 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R233 | | | RK73GB1J333J | CHIP R 33K J 1/16W | |
| R129 | | | RK73GB1J331J | CHIP R 330 J 1/16W | | R234,235 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R130 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | | R236 | | | RK73GB1J823J | CHIP R 82K J 1/16W | |
| R131 | | | RK73GB1J681J | CHIP R 680 J 1/16W | | R237 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R132 | | | R92-0670-05 | CHIP R 0 OHM | | R242 | | | RK73GB1J393J | CHIP R 39K J 1/16W | |
| R133-136 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R501 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R138 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | R502 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R140 | | | RK73FB2A2R2J | CHIP R 2.2 J 1/10W | | R503 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R141 | | | R92-0685-05 | CHIP R 22 J 1/2W | | R504-507 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R142 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | R508 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R143 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | R510 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R145,146 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | R511 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R147,148 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R512 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R149 | | | RK73GB1J151J | CHIP R 150 J 1/16W | | R513 | | | RK73GB1J683J | CHIP R 68K J 1/16W | |
| R150 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R514 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R151 | | | RK73FB2A102J | CHIP R 1.0K J 1/10W | | R515,516 | | | RK73GB1J153J | CHIP R 15K J 1/16W | |
| R152 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R517 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R153 | | | R92-0670-05 | CHIP R 0 OHM | | R518 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R154 | | | RK73GB1J152J | CHIP R 1.5K J 1/16W | | R519 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R155 | | | RK73GB1J104J | CHIP R 100K J 1/16W | | R520-522 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| R156 | | | RK73FB2A5R6J | CHIP R 5.6 J 1/10W | | R527 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R158 | | | R92-0670-05 | CHIP R 0 OHM | | R528 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R159 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | R530 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |

PARTS LIST

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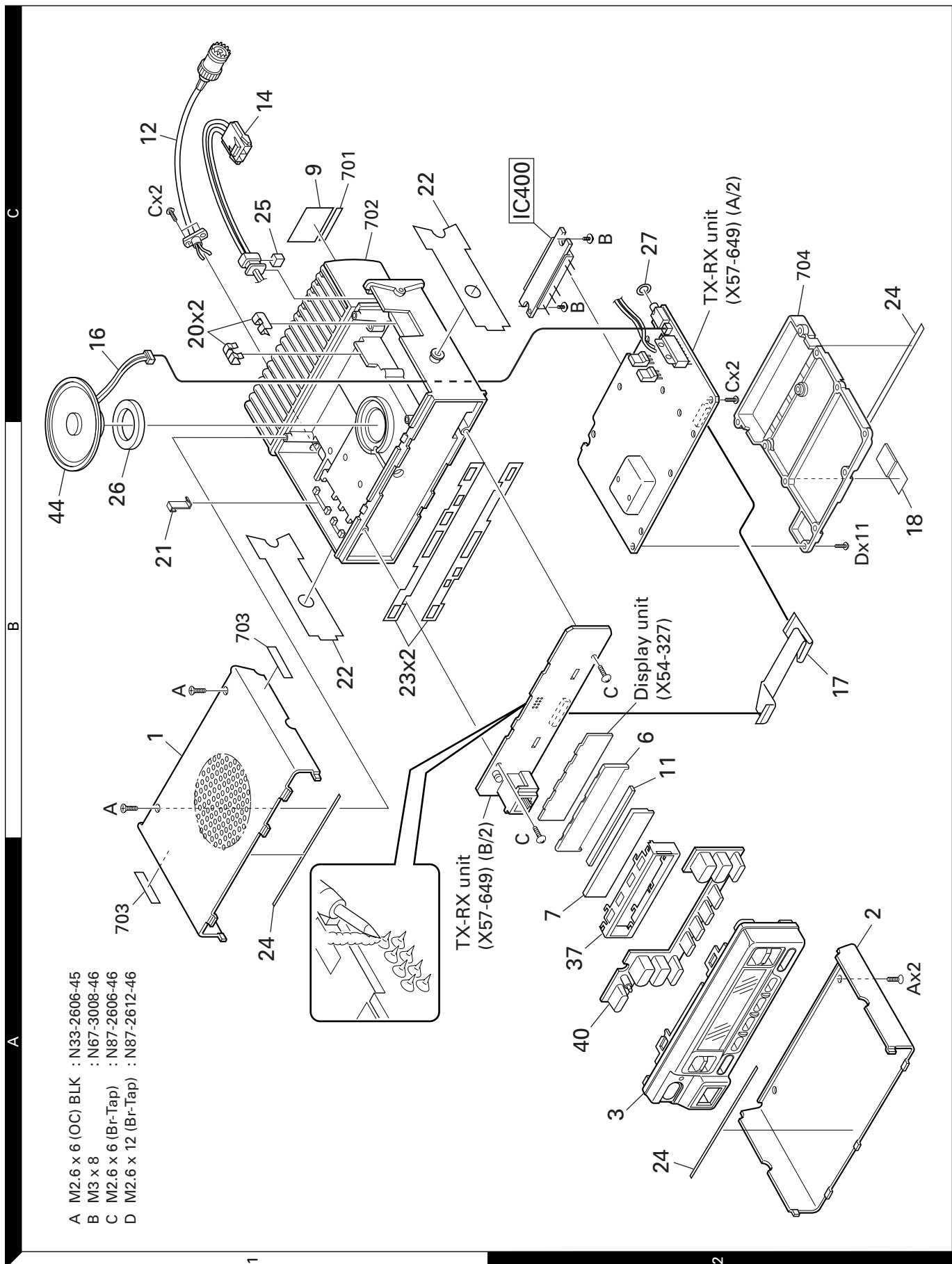
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| R531 | | | RK73GB1J564J | CHIP R 560K J 1/16W | | R610,611 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R533 | | | RK73GB1J564J | CHIP R 560K J 1/16W | | R612 | | | R92-1201-05 | CHIP R 220 J 1/2W | |
| R534 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | R613 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R536 | | | RK73GB1J153J | CHIP R 15K J 1/16W | | R614,615 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R538 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | R616 | | | RK73GB1J474J | CHIP R 470K J 1/16W | |
| R539 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | R617 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R540 | | | RK73GB1J223J | CHIP R 22K J 1/16W | | R618 | | | RK73GB1J683J | CHIP R 68K J 1/16W | |
| R541 | | | RK73GB1J184J | CHIP R 180K J 1/16W | | R619 | | | RK73GB1J104J | CHIP R 100K J 1/16W | |
| R543 | | | RK73GB1J184J | CHIP R 180K J 1/16W | | R620,621 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| R546 | | | RN73GH1J913D | CHIP R 91K D 1/16W | | R622 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R548 | | | RN73GH1J333D | CHIP R 33K D 1/16W | | R630 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R549 | | | RN73GH1J913D | CHIP R 91K D 1/16W | | R701 | | | RK73GB1J683J | CHIP R 68K J 1/16W | |
| R550 | | | RN73GH1J683D | CHIP R 68K D 1/16W | | R722 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R553 | | | RK73GB1J105J | CHIP R 1.0M J 1/16W | | R724 | | | RK73GB1J473J | CHIP R 47K J 1/16W | |
| R554 | | | RN73GH1J913D | CHIP R 91K D 1/16W | | R725 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | |
| R557 | | | RN73GH1J274D | CHIP R 270K D 1/16W | | R726 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | |
| R558 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | D1 | | | DA204U | DIODE | |
| R559 | | | RK73GB1J333J | CHIP R 33K J 1/16W | | D2 | | | 02D220(Y,Z) | ZENER DIODE | |
| R560 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | D3-5 | | | DA204U | DIODE | |
| R561 | | | RK73GB1J333J | CHIP R 33K J 1/16W | | D8 | | | DAN235E | DIODE | |
| R562 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | D9 | | | 1SS355 | DIODE | |
| R563 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | D10 | | | DAN235E | DIODE | |
| R564 | | | RK73GB1J223J | CHIP R 22K J 1/16W | | D11 | | | MA742 | DIODE | |
| R565 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | D14 | | | 1SS355 | DIODE | |
| R566 | | | RK73GB1J563J | CHIP R 56K J 1/16W | | D15 | | | DAN202K | DIODE | |
| R567 | | | RK73GB1J334J | CHIP R 330K J 1/16W | | D16 | | | DAN235E | DIODE | |
| R568 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | D17 | | | DA204U | DIODE | |
| R569 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | D18 | | | KV1848K | VARIABLE CAPACITANCE DIODE | |
| R570 | | | RK73GB1J155J | CHIP R 1.5M J 1/16W | | D19,20 | | | 1SS355 | DIODE | |
| R571 | | | RN73GH1J682D | CHIP R 6.8K D 1/16W | | D21 | | | 02DZ18(X,Y) | ZENER DIODE | |
| R572 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | D23 | | | KV1848K | VARIABLE CAPACITANCE DIODE | |
| R573 | | | RK73GB1J474J | CHIP R 470K J 1/16W | | D24 | | | 02DZ15(X,Y) | ZENER DIODE | |
| R574 | | | RN73GH1J683D | CHIP R 68K D 1/16W | | D25 | | | 22ZR-10D | SURGE ABSORBER | |
| R575 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | D26 | | | DSA3A1-FK | DIODE | |
| R576 | | | RK73GB1J224J | CHIP R 220K J 1/16W | | D27 | | | 1SS355 | DIODE | |
| R577 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | D28 | | | KV1848K | VARIABLE CAPACITANCE DIODE | |
| R578 | | | RN73GH1J682D | CHIP R 6.8K D 1/16W | | D30 | | | MA4PH633 | DIODE | |
| R579 | | | RK73GB1J223J | CHIP R 22K J 1/16W | | D31 | | | KV1848K | VARIABLE CAPACITANCE DIODE | |
| R580 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | D33,34 | | | XB15A709 | DIODE | |
| R581 | | | RK73GB1J394J | CHIP R 390K J 1/16W | | D35,36 | | | MA742 | DIODE | |
| R582 | | | RK73GB1J273J | CHIP R 27K J 1/16W | | D39 | | | UDZS4.7B | ZENER DIODE | |
| R583 | | | RK73GB1J470J | CHIP R 47 J 1/16W | | D40 | | | RB706F-40 | DIODE | |
| R584 | | | RK73GB1J220J | CHIP R 22 J 1/16W | | D41 | | | 1SS355 | DIODE | |
| R585 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | D42 | | | HZU5ALL | DIODE | |
| R586 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | D54 | | | MA2S111 | DIODE | |
| R587 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | D501-504 | | | MA2S111 | DIODE | |
| R592 | | | RK73GB1J103J | CHIP R 10K J 1/16W | | D506,507 | | | MA2S111 | DIODE | |
| R593 | | | RK73GB1J181J | CHIP R 180 J 1/16W | | D508 | | | RB706F-40 | DIODE | |
| R594 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | | D523 | | | DAN202U | DIODE | |
| R595 | | | RK73GB1J181J | CHIP R 180 J 1/16W | | D524,525 | | | DA204U | DIODE | |
| R598 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | D526 | | | 1812L075PR | VARISTOR | |
| R599 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | D527,528 | | | DA204U | DIODE | |
| R600 | | | R92-1252-05 | CHIP R 0 OHM J 1/16W | | D529 | | | RB706F-40 | DIODE | |
| R602 | | | RK73GB1J473J | CHIP R 47K J 1/16W | | IC1,2 | | | TA75S01F | MOS IC | |
| R603 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | IC3 | | | MB15A02 | MOS IC | |
| R604 | | | RK73GB1J472J | CHIP R 4.7K J 1/16W | | IC4 | | | NJM4558M | MOS IC | |
| R605 | | | RK73GB1J332J | CHIP R 3.3K J 1/16W | | IC5 | | | TA31136FN | MOS IC | |
| R606 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | | IC6 | | | M62363FP | MOS IC | |
| R607 | | | RK73GB1J101J | CHIP R 100 J 1/16W | | IC7 | | | NJM2904M | MOS IC | |
| R608 | | | RK73GB1J122J | CHIP R 1.2K J 1/16W | | | | | | | |

PARTS LIST

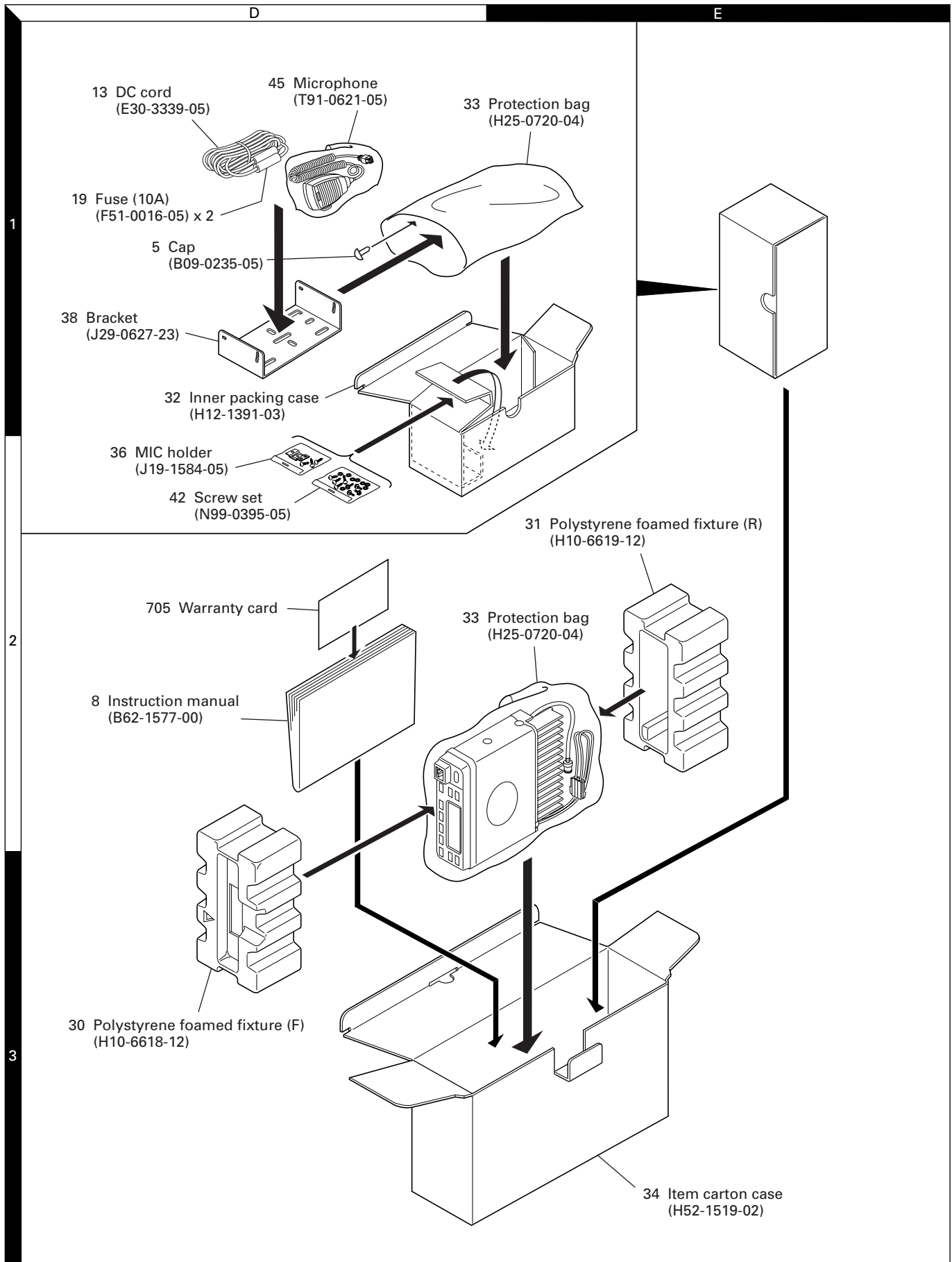
TX-RX UNIT (X57-6490-10)
PLL/VCO (X58-4670-17)

| Ref. No. | Address | New parts | Parts No. | Description | Destination | Ref. No. | Address | New parts | Parts No. | Description | Destination |
|----------|---------|-----------|----------------|--------------------|-------------|-----------------------|---------|-----------|---------------|------------------------------|-------------|
| IC9 | 2C | | BU4094BCF | MOS IC | | TH1 | | | 157-153-65001 | THERMISTOR | |
| IC10 | | | NJM78L05UA | BI-POLAR IC | | PLL/VCO (X58-4670-17) | | | | | |
| IC11 | | | AN8009M | MOS IC | | C102 | | | CK73GB1H471K | CHIP C 470PF K | |
| IC12 | | | TA7808S | MOS IC | | C104 | | | CC73GCH1H120J | CHIP C 12PF J | |
| IC13 | | | LA4422 | BI-POLAR IC | | C105 | | | CC73GCH1H070D | CHIP C 7.0PF D | |
| IC14 | | | TC4013BF(N) | MOS IC | | C107 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| IC15 | | | TA75S01F | MOS IC | | C108 | | | CC73GCH1HR75B | CHIP C 0.75PF B | |
| IC400 | | | S-AU27AM(K3) | RF POWER MODULE | | C110 | | | CC73GCH1H030B | CHIP C 3.0PF B | |
| IC501 | | | AT29C020-90TI | ROM IC | | C111 | | | CC73GCH1H050B | CHIP C 5.0PF B | |
| IC502 | | | 30622M4A-410GP | MPU | | C112 | | | CC73GCH1H1R5B | CHIP C 1.5PF B | |
| IC503 | | | RH5VL42C | MOS IC | | C113 | | | CC73GCH1H010B | CHIP C 1.0PF B | |
| IC505 | | | AT2408N10SI2.5 | ROM IC | | C114 | | | CC73GCH1H040B | CHIP C 4.0PF B | |
| IC505 | | | 24LC08BT-1SN | ROM IC | | C115 | | | CC73GCH1H060D | CHIP C 6.0PF D | |
| IC507 | | | NJM2904V | MOS IC | | C116 | | | CC73GCH1H050B | CHIP C 5.0PF B | |
| IC508 | | | TC35453F | MOS IC | | C117 | | | CK73GB1H471K | CHIP C 470PF K | |
| IC509 | | | BU4066BCFV | MOS IC | | C118 | | | CC73GCH1H050B | CHIP C 5.0PF B | |
| IC510 | | | BU4094BCFV | MOS IC | | C119,120 | | | CK73GB1H471K | CHIP C 470PF K | |
| IC512 | | | NJM78L05UA | BI-POLAR IC | | C121 | | | CC73GCH1H050B | CHIP C 5.0PF B | |
| IC513 | | | TA75W558FU | MOS IC | | C122 | | | CC73GCH1H0R5B | CHIP C 0.5PF B | |
| Q1 | | | DTD114EK | DIGITAL TRANSISTOR | | C123 | | | CK73GB1H471K | CHIP C 470PF K | |
| Q2 | | | KRA225S | DIGITAL TRANSISTOR | | C124 | | | CC73GCH1H0R5B | CHIP C 0.5PF B | |
| Q3 | | | DTA114EKA | DIGITAL TRANSISTOR | | C125 | | | CK73GB1H102K | CHIP C 1000PF K | |
| Q4-6 | | | DTC114EKA | DIGITAL TRANSISTOR | | C126 | | | CK73GB1H471K | CHIP C 470PF K | |
| Q7 | | | 2SC4649(N,P) | TRANSISTOR | | C127 | | | CC73GCH1H050B | CHIP C 5.0PF B | |
| Q8 | | | 2SC2412K | TRANSISTOR | | TC106 | | | C05-0384-05 | CERAMIC TRIMMER CAP (10PF) | |
| Q9 | | | 2SC4226(R24) | TRANSISTOR | | TC109 | | | C05-0384-05 | CERAMIC TRIMMER CAP (10PF) | |
| Q10 | | | 2SC2412K | TRANSISTOR | | CN101 | | | E40-6019-05 | PIN ASSY | |
| Q11 | | | 2SA1774(S) | TRANSISTOR | | - | | | F10-2279-04 | SHIELDING CASE | |
| Q12 | | | 2SC4617(S) | TRANSISTOR | | L101-104 | | | L40-1595-34 | SMALL FIXED INDUCTOR (1.5UH) | |
| Q13 | | | 2SC4649(N,P) | TRANSISTOR | | L105 | | | L40-3975-34 | SMALL FIXED INDUCTOR (39NH) | |
| Q14 | | | 2SC5110(O) | TRANSISTOR | | L106 | | | L40-2775-34 | SMALL FIXED INDUCTOR (27NH) | |
| Q15 | | | 3SK255 | FET | | L107,108 | | | L40-1098-76 | SMALL FIXED INDUCTOR (1UH) | |
| Q16 | | | DTC114EKA | DIGITAL TRANSISTOR | | L109,110 | | | L40-1595-34 | SMALL FIXED INDUCTOR (1.5UH) | |
| Q17 | | | DTC363EU | DIGITAL TRANSISTOR | | L111 | | | L34-4547-05 | AIR-CORE COIL | |
| Q18 | | | 2SA1745(6,7) | TRANSISTOR | | L115 | | | L34-4547-05 | AIR-CORE COIL | |
| Q19 | | | DTC114EKA | DIGITAL TRANSISTOR | | R101,102 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| Q20 | | | DTA114EKA | DIGITAL TRANSISTOR | | R103 | | | RK73GB1J102J | CHIP R 1.0K J 1/16W | |
| Q21 | | | DTC114EKA | DIGITAL TRANSISTOR | | R104 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| Q22 | | | 2SC4093 | TRANSISTOR | | R105 | | | RK73GB1J154J | CHIP R 150K J 1/16W | |
| Q23 | | | 2SA1641(S,T) | TRANSISTOR | | R106 | | | RK73GB1J470J | CHIP R 47 J 1/16W | |
| Q24 | | | DTA114EKA | DIGITAL TRANSISTOR | | R107-110 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| Q25 | | | 2SC3357 | TRANSISTOR | | R111 | | | RK73GB1J331J | CHIP R 330 J 1/16W | |
| Q26 | | | DTA114EKA | DIGITAL TRANSISTOR | | R112,113 | | | RK73GB1J221J | CHIP R 220 J 1/16W | |
| Q27 | | | 2SC2954 | TRANSISTOR | | R114 | | | RK73GB1J470J | CHIP R 47 J 1/16W | |
| Q28 | | | 2SB1132(Q,R) | TRANSISTOR | | R115 | | | RK73GB1J103J | CHIP R 10K J 1/16W | |
| Q29 | | | DTC114EKA | DIGITAL TRANSISTOR | | R116 | | | RK73GB1J392J | CHIP R 3.9K J 1/16W | |
| Q31 | | | 2SC2412K | TRANSISTOR | | R117 | | | RK73GB1J101J | CHIP R 100 J 1/16W | |
| Q32 | | | 2SB1565(E,F) | TRANSISTOR | | D101-104 | | | 1SV283 | VARIABLE CAPACITANCE DIODE | |
| Q33 | | | DTC114EKA | DIGITAL TRANSISTOR | | D105 | | | 1SV214 | VARIABLE CAPACITANCE DIODE | |
| Q34 | | | 3SK255 | FET | | Q101 | | | 2SK508NV(K52) | FET | |
| Q35 | | | DTC144EKA | DIGITAL TRANSISTOR | | Q102 | | | DTC114EUA | DIGITAL TRANSISTOR | |
| Q36 | | | 2SC2412K | TRANSISTOR | | Q103 | | | 2SK508NV(K52) | FET | |
| Q37,38 | | | 2SK1824 | FET | | Q104,105 | | | 2SC4081 | TRANSISTOR | |
| Q501 | | | 2SC4649(N,P) | TRANSISTOR | | Q106 | | | 2SC4226(R24) | TRANSISTOR | |
| Q502,503 | | | DTC114EE | DIGITAL TRANSISTOR | | | | | | | |
| Q504 | | | 2SC4617(S) | TRANSISTOR | | | | | | | |
| Q505 | | | 2SB1132(Q,R) | TRANSISTOR | | | | | | | |
| Q506 | | | DTC114EE | DIGITAL TRANSISTOR | | | | | | | |
| Q508 | | | 2SC4617(S) | TRANSISTOR | | | | | | | |
| Q509 | | | DTC363EU | DIGITAL TRANSISTOR | | | | | | | |

EXPLODED VIEW



PACKING



ADJUSTMENT

Test Mode

■ Test Mode Operating Features

This transceiver has a test mode. **To enter test mode, press [SCN] key and turn power on. Hold [SCN] key until test channel No. and test signalling No. appears on LCD.** Test mode can be inhibited by programming. To exit test mode, switch the power on again. The following functions are available in test mode.

• Controls

| | |
|-------------|----------------------------------|
| [PTT] | Used when making a transmission. |
| [MON] | Monitor on and off. |
| [SCN] | Sets to the tuning mode. |
| [A] | Function on. |
| [D/A] | RF power high and low. |
| [▼] | Changes signalling. |
| [▲] | Changes wide and narrow |
| [↗/↘] | Changes channel. |
| [Volume↗/↘] | Volume up/down. |

• LCD indicator

| | |
|------------------|-------------------------|
| "SCN" | Unused. |
| "AUX" | Lights at RF power low. |
| "MON" | Lights at monitor on. |
| "Right side dot" | Lights at narrow. |

• LED indicator

| | |
|-----------|---------------------------------|
| Red LED | Lights during transmission. |
| Green LED | Lights when there is a carrier. |

■ Frequency and Signalling

The set has been adjusted for the frequencies shown in the following table. When required, re-adjust them following the adjustment procedure to obtain the frequencies you want in actual operation.

• Frequency (MHz)

| Channel No. | RX | TX |
|-------------|---------|---------|
| 1 (Center) | 470.050 | 470.100 |
| 2 (Low) | 450.050 | 450.100 |
| 3 (High) | 489.950 | 489.900 |
| 4 | 470.000 | 470.000 |
| 5 | 470.200 | 470.200 |
| 6 | 470.400 | 470.400 |
| 7~16 | — | — |

• Signalling

| No. | Decode | Encode |
|-----|------------|-------------------|
| 1 | None | None |
| 2 | None | 100Hz square wave |
| 3 | LTR data | LTR data |
| 4 | QT 67.0Hz | QT 67.0Hz |
| 5 | QT 151.4Hz | QT 151.4Hz |
| 6 | QT 210.7Hz | QT 210.7Hz |
| 7 | QT 250.3Hz | QT 250.3Hz |
| 8 | DQT D023N | DQT D023N |
| 9 | DQT D754I | DQT D754I |
| 10 | None | DTMF tone 9 |

• Preparations for tuning the transceiver

Before attempting to tune the transceiver, connect the unit to a suitable power supply.

Whenever the transmitter is turned, the unit must be connected to a suitable dummy load (i.e. power meter).

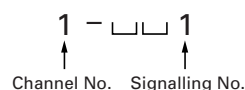
The speaker output connector must be terminated with a 4Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

• Transceiver tuning

(To place transceiver in tuning mode)

Channel appears on LCD. Set channel according to tuning requirements.

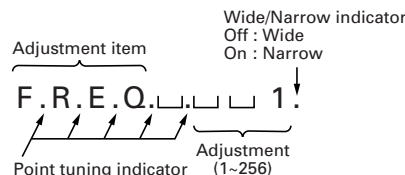
LCD display (Test mode)



Press [SCN], now in tuning mode. Use [D/A] button to write tuning data through tuning modes, and [↗/↘] to adjust tuning requirements (1 to 256 appears on LCD).

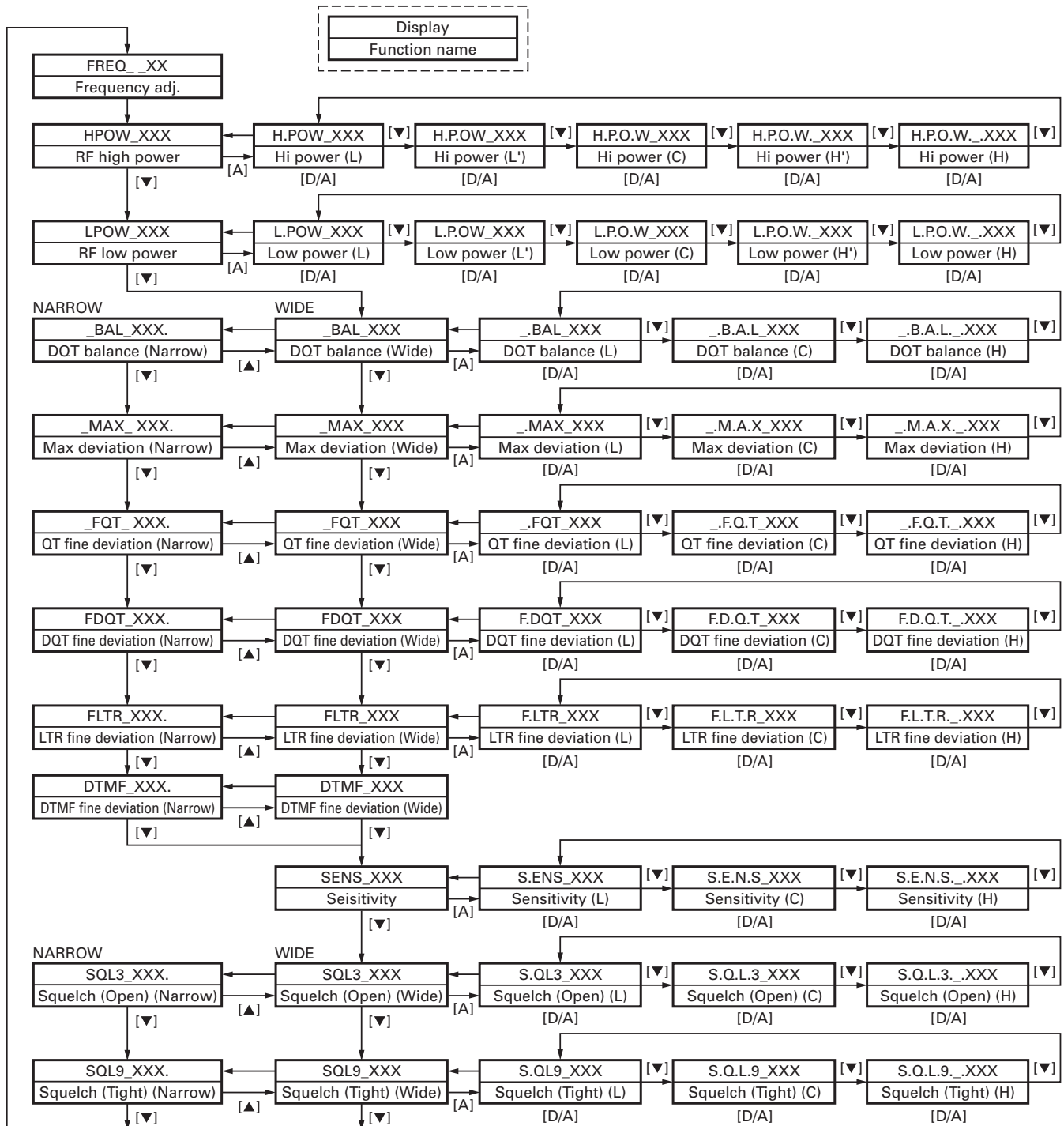
Use [▼] button to select the adjustment item through tuning modes. Use [A] button to adjust 3-point or 5-point tuning, and use [▲] button to switch between wide/narrow.

LCD display (Tuning mode)



ADJUSTMENT

■ Tuning Mode



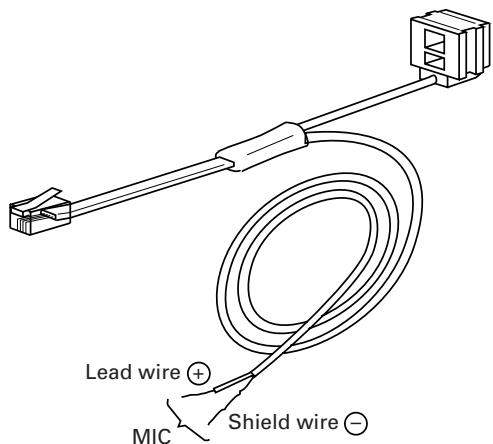
ADJUSTMENT

Test Equipment Required for Alignment

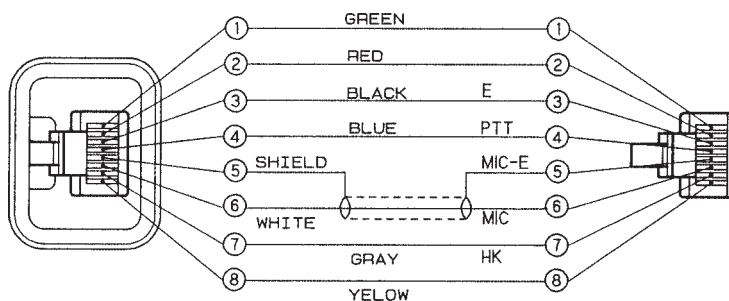
| Test Equipment | Major Specifications | |
|---------------------------------------|--|--|
| 1. Standard Signal Generator (SSG) | Frequency Range Modulation Output | 450 to 490MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -7dBm/100mV |
| 2. Power Meter | Input Impedance Operation Frequency Measurement Capability | 50Ω 450 to 490MHz or more Vicinity of 100W |
| 3. Deviation Meter | Frequency Range | 450 to 490MHz |
| 4. Digital Volt Meter (DVM) | Measuring Range Accuracy | 1 to 20V DC High input impedance for minimum circuit loading |
| 5. Oscilloscope | | DC through 30MHz |
| 6. High Sensitivity Frequency Counter | Frequency Range Frequency Stability | 10Hz to 1000MHz 0.2ppm or less |
| 7. Ammeter | | 20A |
| 8. AF Volt Meter (AF VTVM) | Frequency Range Voltage Range | 50Hz to 10kHz 1mV to 3V |
| 9. Audio Generator (AG) | Frequency Range Output | 20Hz to 20kHz or more 0 to 1V |
| 10. Distortion Meter | Capability Input Level | 3% or less at 1kHz 50mV to 10Vrms |
| 11. 4Ω Dummy Load | | Approx. 4Ω, 10W or more |
| 12. Regulated Power Supply | | 13.6V, approx. 20A (adjustable from 9 to 17V) Useful if ammeter requipped |

Tuning cable (E30-3383-05)

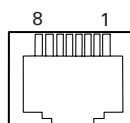
Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used.
See "PC Mode" section for the connection.



Test cable for microphone input (E30-3360-08)



MIC connector (Front view)

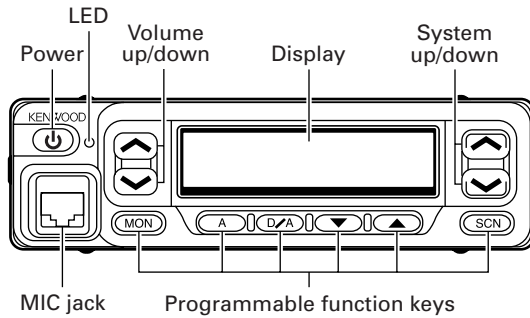


- 1 : BLC
- 2 : PSB
- 3 : E
- 4 : PTT
- 5 : ME
- 6 : MIC
- 7 : HOOK
- 8 : CM

ADJUSTMENT

Adjustment Location

■ Switch



■ Note

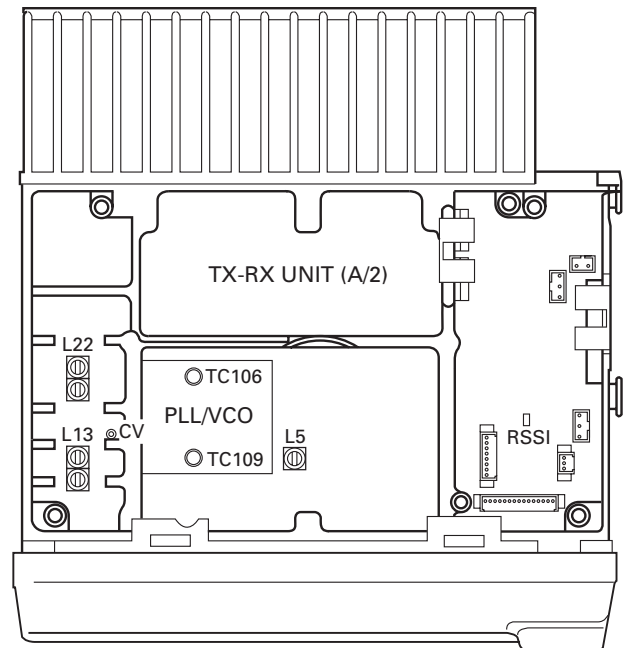
• Flash memory

The firmware program (User mode, Test mode, Tuning mode, etc.) and the data programmed by the FPU (KPG-76D) for the flash memory, is stored in memory. When parts are changed, program the data again.

• EEPROM

The tuning data (Deviation, Squelch, etc.) for the EEPROM, is stored in memory. When parts are changed, readjust the transceiver.

■ Adjustment Point



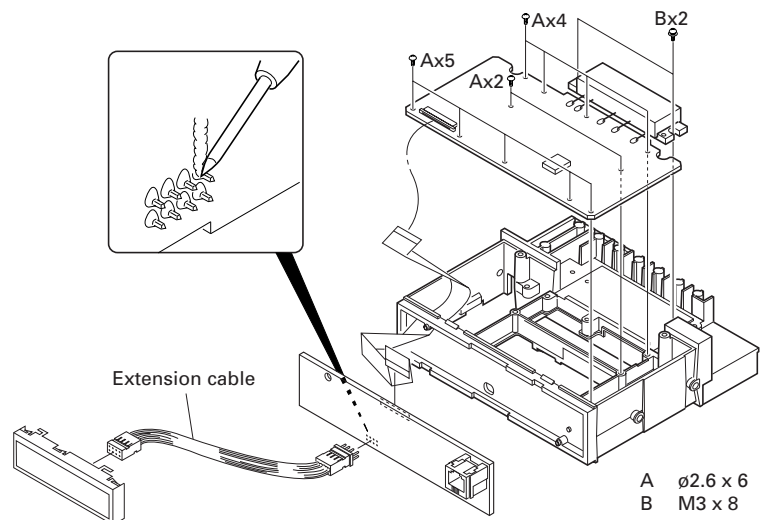
■ Repair Jig

• Chassis

Use jig (Part No. : A10-4010-02) for repairing the TK-863G. The jig facilitates the voltage check when the voltage on the component side TX-RX unit (A/2) is checked during repairs.

• Extension cable

Part No. : E30-3404-05



ADJUSTMENT

Common Section

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|---------------------|---|---------------------------------|----------------|----------|------------|-------|--------|------------------------|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 1. PLL lock voltage | RX 1) Set test mode CH : CH3 - Sig1 | DVM Power meter F. conter | TX-RX (A/2) | CV | PLL | TC106 | 6.0V | ±0.1V |
| | TX 2) PTT : ON (Transmit) | | | | | TC109 | 6.5V | |
| | RX 3) CH : CH2 - Sig1 AUX : ON (talk-around mode) | | | | | | Check | 0.9V or more |
| | TX 4) PTT : ON (Transmit) | | | | | | | 0.9V or more |

Receiver Section

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|----------------------------|---|--|----------------|------------------------|----------------|------------|--|------------------------|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 1. Discriminator • Wide | 1) Set test mode CH : CH1 - Sig1 SSG output : -53dBm/501μV SSG MOD : 3kHz AF : 1.4V/4Ω | SSG AF VTVM Oscilloscope | Rear panel | ANT ACC (EXT.SP) | TX-RX (A/2) | L5 | AF output maximum. | |
| 2. Sensitivity • Wide | 1) Set test mode Select "SENS" in tuning mode. "S.E.N.S." Adjust [250] SSG freq' : 489.950MHz SSG output : -103dBm/1.58μV SSG MOD : 3kHz AF output : 1V/4Ω | SSG AF VTVM Distortion meter Oscilloscope AG | Rear panel | ANT ACC (EXT.SP) | TX-RX (A/2) | L13 L22 | RSSI voltage maximum. | |
| | 2) "S.ENS" Adjust [***] SSG freq' : 450.050MHz | DVM | TX-RX (A/2) | RSSI | Front panel | ~/~ | RSSI voltage maximum. | |
| | 3) "S.E.N.S._." Adjust [***] SSG freq' : 470.050MHz | | | | | | | |
| 3. Squelch 3 • Wide | 1) Set test mode Select "SQL3" in tuning mode. "S.QL3" Adjust [***] SSG freq' : 450.050MHz SSG output : -124dBm/0.14μV SSG MOD : 3kHz (Wide) 1.5kHz (Narrow) | SSG AF VTVM Distortion meter Oscilloscope AG | Rear panel | ANT ACC (EXT.SP) | Front panel | ~/~ | Adjust to the squelch threshold point. | |
| | 2) "S.Q.L.3" Adjust [***] SSG freq' : 470.050MHz | | | | | | | |
| | 3) "S.Q.L.3._." Adjust [***] SSG freq' : 489.950MHz | | | | | | | |
| | 4) "SQL3***." Adjust [***] SSG freq' : 470.050MHz | | | | | | | |
| • Narrow | | | | | | | | |




ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|------------------------------|--|--|------------|------------------------|-------------|-------|--|--|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 4. Squelch 9 • Wide | 1) Set test mode Select "SQL9" in tuning mode. "S.QL9" Adjust [***] SSG freq' : 450.050MHz SSG output : -116dBm/0.35μV SSG MOD : 3kHz (Wide) 1.5kHz (Narrow) | SSG AF VTVM Distortion meter Oscilloscope AG | Rear panel | ANT ACC (EXT.SP) | Front panel | ~/~ | Adjust to the squelch threshold point. | |
| | 2) "S.Q.L.9" Adjust [***] SSG freq' : 470.050MHz | | | | | | | |
| | 3) "S.Q.L.9._." Adjust [***] SSG freq' : 489.950MHz | | | | | | | |
| | 4) "SQL9***." Adjust [***] SSG freq' : 470.050MHz | | | | | | | |
| 5. Squelch check • Narrow | 1) Set test mode CH : CH1 - Sig1~CH3 - Sig1 SSG output : -116dBm/0.35μV Squelch level : 5 | | | | | | Check | Squelch must be opened. (Wide/Narrow) |
| | 2) SSG output : OFF | | | | | | | Squelch must be closed. (Wide/Narrow) |
| 6. QT check | 1) Set test mode CH : CH1 - Sig5 SSG MOD INT : 3kHz (Wide) 1.5kHz (Narrow) EXT : 151.4Hz SSG system MOD DEV : ±3.75kHz (Wide) ±1.85kHz (Narrow) SSG output : 10dB SINAD level | | | | | | Check | Squelch must be opened. |
| | 2) CH : CH1 - Sig4 CH1 - Sig6 CH1 - Sig7 | | | | | | | |


Transmitter Section

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|-----------------|---|---------------------------|------------|----------|-------------|-------|--------|------------------------|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 1. Frequency | 1) Set test mode Select "FREQ" in tuning mode. PTT : ON Adjust [_**] | Power meter F. counter | Rear panel | ANT | Front panel | ~/~ | Check | 470.100MHz±100Hz |
| 2. Power output | 1) Maximum power Set test mode Select "HPOW" in tuning mode. "H.POW" Adjust [256] PTT : ON | | | | | | Check | More than 26.0W |


ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|-------------------------------------|--|---|----------------|------------------|----------------|---|--|--|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 3. High power | 1) Set test mode Select "HPOW" in tuning mode. "H.POW" PTT : ON Adjust [***] | Power meter F. counter | Rear panel | ANT | Front panel |  | 25.0W | ±1.0W |
| | 2) "H.P.OW" PTT : ON Adjust [***] | | | | | | | |
| | 3) "H.P.O.W" PTT : ON Adjust [***] | | | | | | | |
| | 4) "H.P.O.W." PTT : ON Adjust [***] | | | | | | | |
| | 5) "H.P.O.W._." PTT : ON Adjust [***] | | | | | | | |
| 4. Low power | 1) Set test mode Select "LPOW" in tuning mode. "L.POW" PTT : ON Adjust [***] | Power mete | | | | | 5.0W | ±0.5W |
| | 2) "L.P.OW" PTT : ON Adjust [***] | | | | | | | |
| | 3) "L.P.O.W" PTT : ON Adjust [***] | | | | | | | |
| | 4) "L.P.O.W." PTT : ON Adjust [***] | | | | | | | |
| | 5) "L.P.O.W._." PTT : ON Adjust [***] | | | | | | | |
| 5. Power check | 1) Set test mode CH : CH1 - Sig1 CH2 - Sig1 CH3 - Sig1 PTT : ON | Power meter Ammeter | Rear panel | ANT DC IN | | | Check | 25W±1W, 8A or less |
| 6. Modulation balanced • Wide | 1) Set test mode MIC input : OFF Select "BAL" in tuning mode. "_.BAL" Deviation meter filter LPF : 3kHz HPF : OFF De-emphasis : OFF PTT : ON Adjust [***] | Power meter Deviation meter Oscilloscope | Rear panel | ANT | Front panel |  | Make the de- modulation waveform neat. | (Wide/Narrow)  |
| | | AF VTVM AG | Front panel | MIC | | | | |

ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|--------------------------------|--|--|-------------|----------|-------------|-------|--|--|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| | 2) “_B.A.L.” PTT : ON Adjust [***] | Power meter Deviation meter Oscilloscope | Rear panel | ANT | Front panel | ~/~ | Make the de-modulation waveform neat. | (Wide/Narrow)  |
| | 3) “_B.A.L._.” PTT : ON Adjust [***] | AF VTVM AG | Front panel | MIC | | | | |
| | • Narrow 4) “_BAL***.” PTT : ON Adjust [***] | | | | | | | |
| 7. Maximum deviation • Wide | 1) Set test mode Connect AG to the MIC terminal. Select “MAX” in tuning mode. “_MAX” AG : 1kHz/50mV Deviation meter filter LPF : 15kHz HPF : OFF De-emphasis : OFF PTT : ON Adjust [***] | | | | | | 3.80kHz (Wide) 1.75kHz (Narrow) (According to the larger +, -) | ±50Hz (Wide/Narrow) |
| | 2) “_M.A.X” PTT : ON Adjust [***] | | | | | | | |
| | 3) “_M.A.X._.” PTT : ON Adjust [***] | | | | | | | |
| | • Narrow 4) “_MAX***.” PTT : ON Adjust [***] | | | | | | | |
| 8. MIC sensitivity check | 1) Set test mode CH : CH1 - Sig1 AG : 1kHz/5mV PTT : ON Adjust [***] | | | | | | Check | ±3kHz±0.2kHz (Wide) ±1.5kHz±0.05kHz (Narrow) |
| 9. QT deviation • Wide | 1) Set test mode Select “FQT” in tuning mode. “_FQT” Deviation meter filter LPF : 3kHz, HPF : OFF PTT : ON Adjust [***] | | | | Front panel | ~/~ | 0.75kHz | ±50Hz (Wide/Narrow) |
| | 2) “_F.Q.T” PTT : ON Adjust [***] | | | | | | | |
| | 3) “_F.Q.T._.” PTT : ON Adjust [***] | | | | | | | |
| | • Narrow 4) “_FQT***.” PTT : ON Adjust [***] | | | | | | 0.35kHz | |

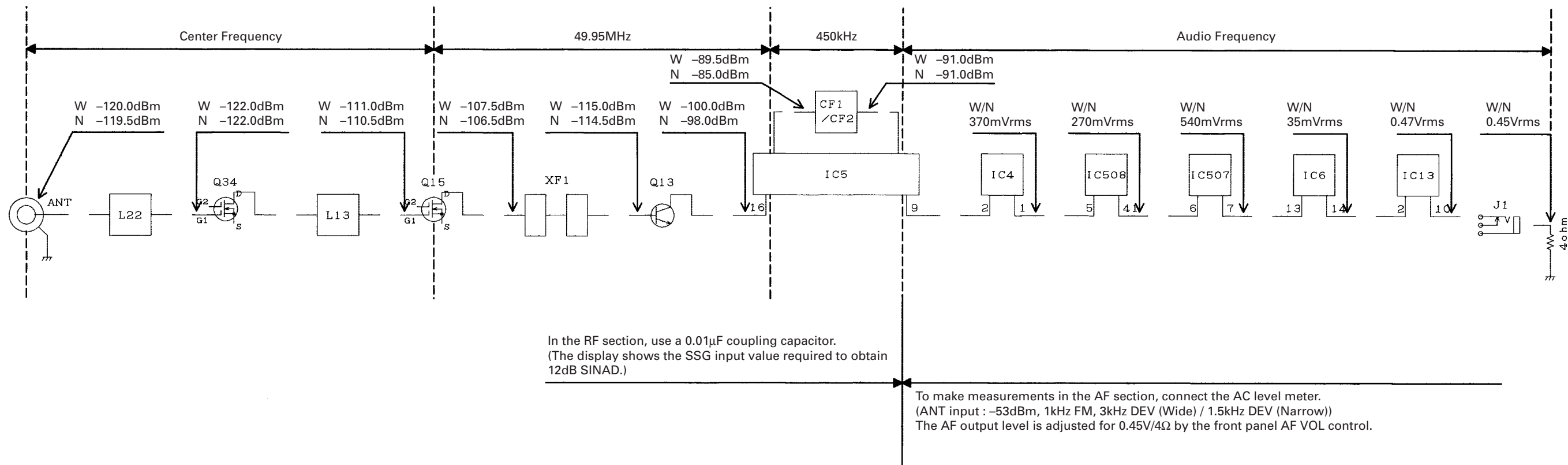
ADJUSTMENT

| Item | Condition | Measurement | | | Adjustment | | | Specifications/Remarks |
|------------------------------|---|--|-------------|----------|-------------|---|---|------------------------|
| | | Test-equipment | Unit | Terminal | Unit | Parts | Method | |
| 10. DQT deviation • Wide | 1) Set test mode Select “FDQT” in tuning mode. “F.DQT” Deviation meter filter LPF : 3kHz HPF : OFF PTT : ON Adjust [***] | Power meter Deviation meter Oscilloscope | Rear panel | ANT | Front panel |  | 0.75kHz | ±50Hz (Wide/Narrow) |
| | 2) “F.D.Q.T.” PTT : ON Adjust [***] | AF VTVM AG | Front panel | MIC | | | | |
| | 3) “F.D.Q.T._.” PTT : ON Adjust [***] | | | | | | | |
| | • Narrow | | | | | | 4) “FDQT***.” PTT : ON Adjust [***] | |
| 11. LTR deviation • Wide | 1) Set test mode Select “FLTR” in tuning mode. “F.LTR” Deviation meter filter LPF : 3kHz HPF : OFF PTT : ON Adjust [***] | | | | | | 1.0kHz | ±50Hz (Wide/Narrow) |
| | 2) “F.L.T.R.” PTT : ON Adjust [***] | | | | | | | |
| | 3) “F.L.T.R._.” PTT : ON Adjust [***] | | | | | | | |
| | • Narrow | | | | | | 4) “FLTR***.” PTT : ON Adjust [***] | |
| 12. DTMF deviation • Wide | 1) Set test mode Select “DTMF” in tuning mode. Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON Adjust [***] | | | | | | 3.0kHz | ±0.2kHz |
| | • Narrow | | | | | | 2) “DTMF***.” PTT : ON Adjust [***] | 1.5kHz |

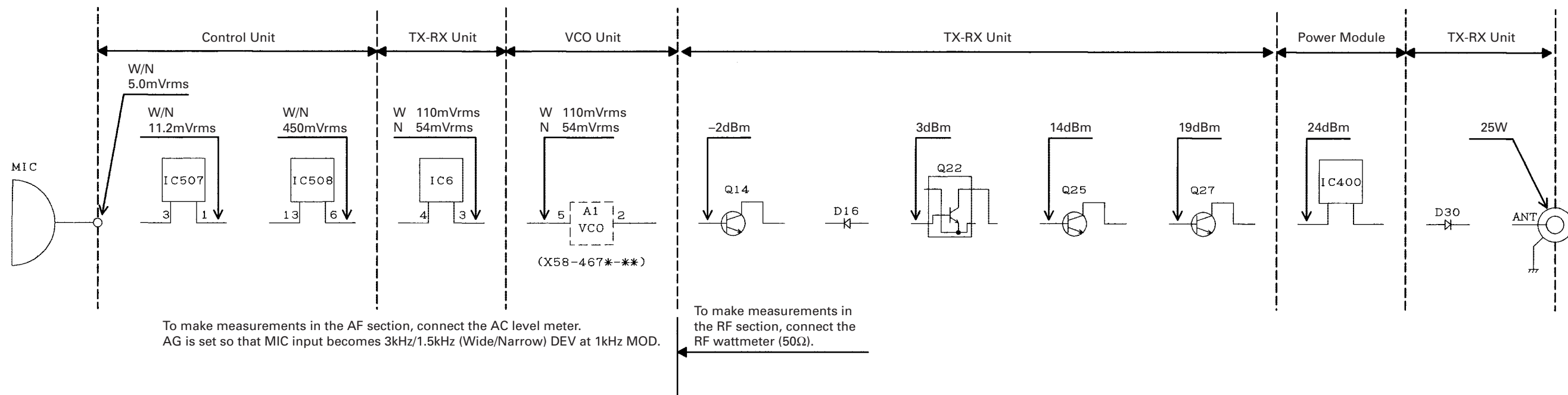
TK-863G TK-863G

LEVEL DIAGRAM

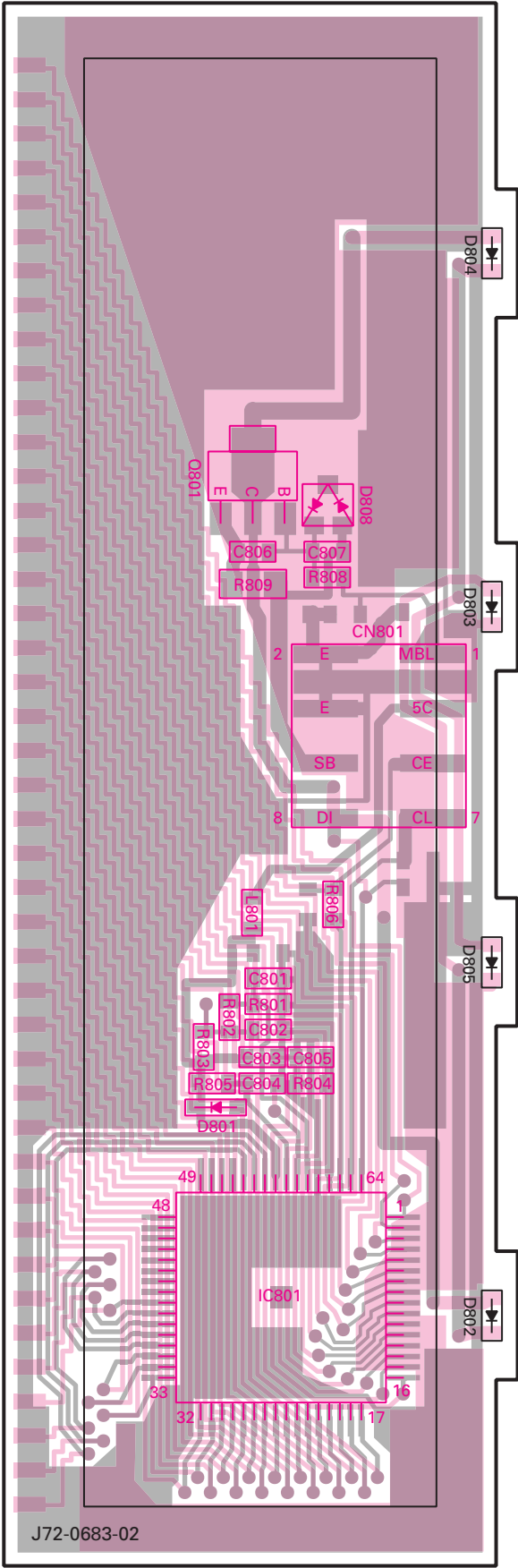
Receiver Section



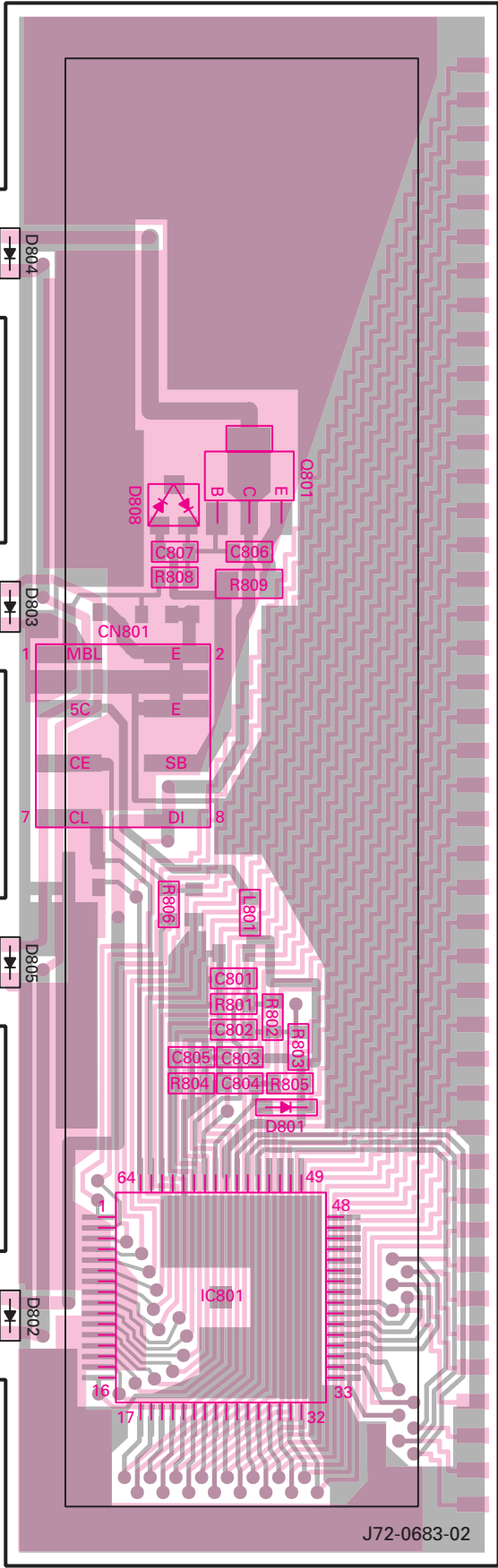
Transmitter Section



DISPLAY UNIT (X54-3270-10) (J72-0683-02)
Component side view

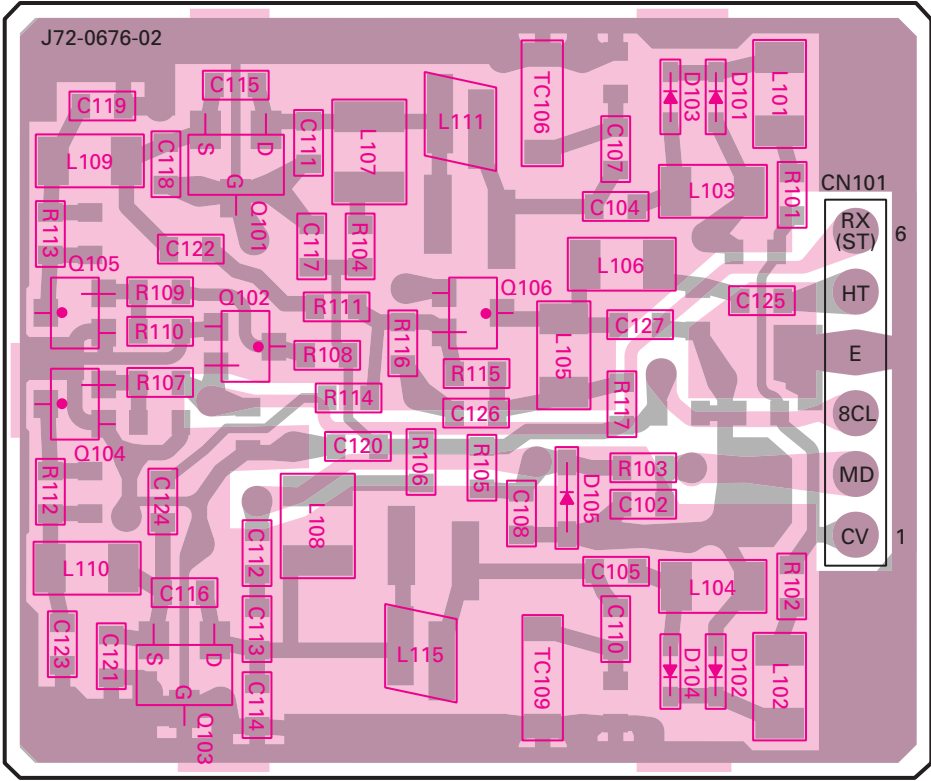


DISPLAY UNIT (X54-3270-10) (J72-0683-02)
Foil side view

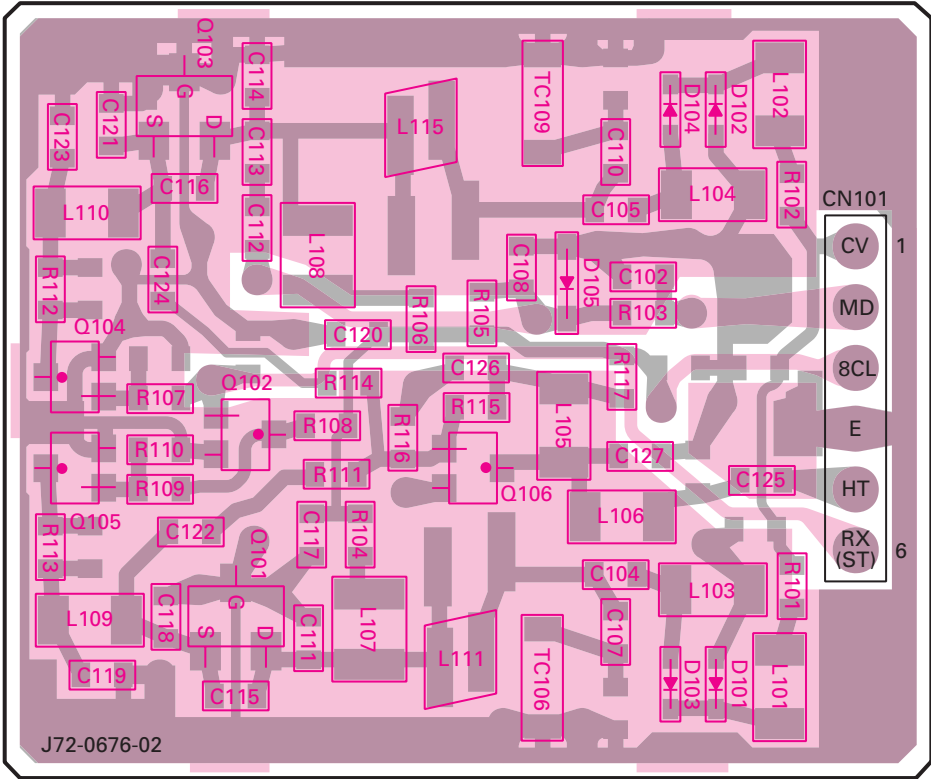


Component side Foil side

PLL/VCO (X58-4670-17) Component side view (J72-0676-02)



PLL/VCO (X58-4670-17) Foil side view (J72-0676-02)

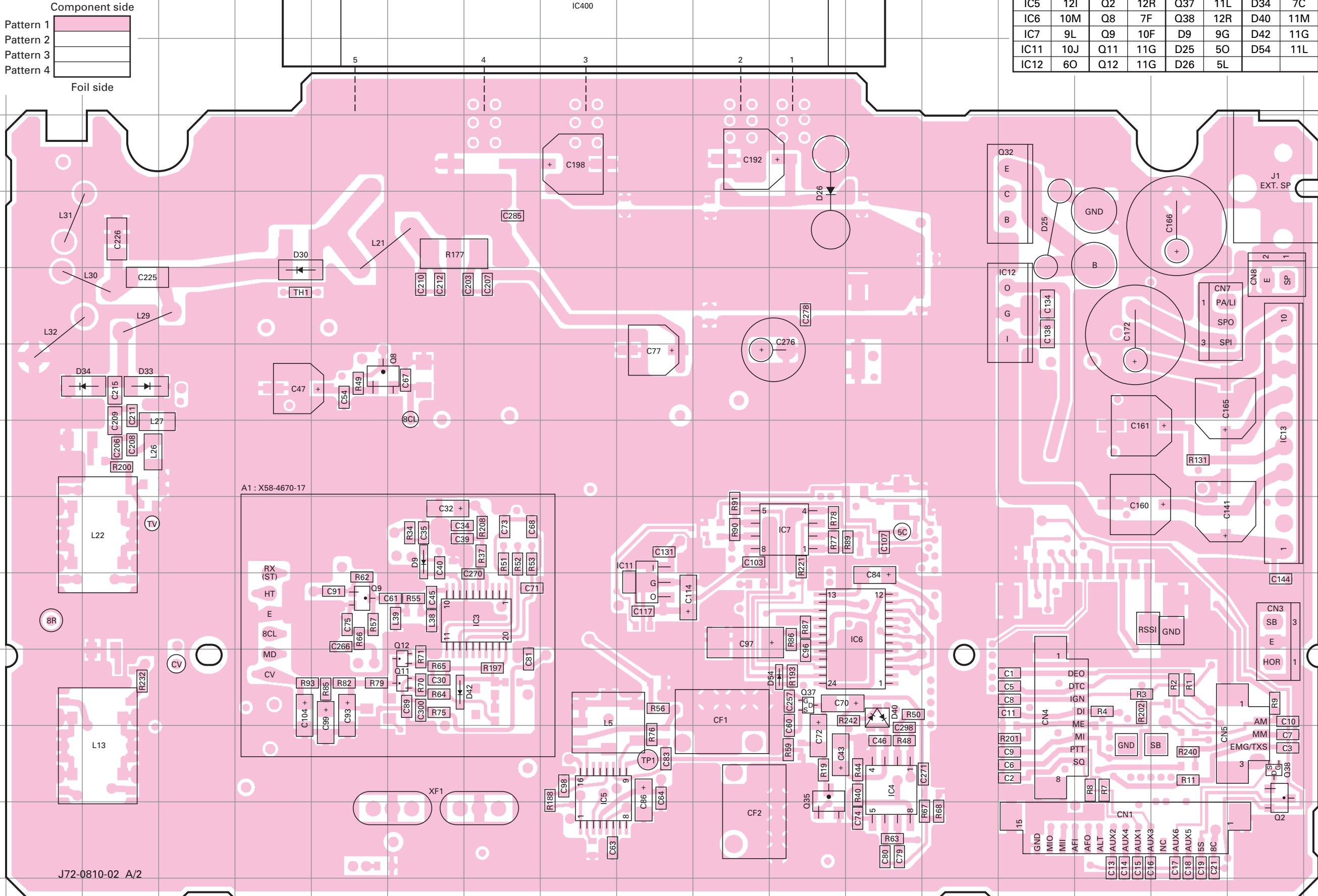


Component side
Foil side

TK-863G PC BOARD VIEW

TX-RX UNIT (X57-6490-10) (A/2) Component side view (J72-0810-02

| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|
| IC3 | 10H | IC13 | 8R | Q32 | 4O | D30 | 6E |
| IC4 | 12M | IC400 | 2I | Q35 | 12L | D33 | 7C |
| IC5 | 12I | Q2 | 12R | Q37 | 11L | D34 | 7C |
| IC6 | 10M | Q8 | 7F | Q38 | 12R | D40 | 11M |
| IC7 | 9L | Q9 | 10F | D9 | 9G | D42 | 11G |
| IC11 | 10J | Q11 | 11G | D25 | 5O | D54 | 11L |
| IC12 | 6O | Q12 | 11G | D26 | 5L | | |



PC BOARD VIEW TK-863G

TX-RX UNIT (X57-6490-10) (A/2) Foil side view (J72-0810-02)

IC400

12345

Component side

Pattern 1

Pattern 2

Pattern 3

Pattern 4

Foil side

| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| IC1 | 11E | Q4 | 12H | Q17 | 9B | Q26 | 8C | D2 | 12B | D16 | 11N | D28 | 9Q |
| IC2 | 9J | Q5 | 11B | Q18 | 13N | Q27 | 6I | D3 | 13C | D17 | 7J | D31 | 9R |
| IC9 | 9G | Q6 | 11B | Q19 | 7C | Q28 | 7I | D4 | 13C | D18 | 12Q | D35 | 7Q |
| IC10 | 8E | Q7 | 11K | Q20 | 8C | Q29 | 7H | D5 | 13D | D19 | 8B | D36 | 7R |
| IC14 | 9D | Q10 | 13G | Q21 | 7C | Q31 | 6H | D8 | 12J | D20 | 8D | D39 | 8L |
| IC15 | 7O | Q13 | 13K | Q22 | 7L | Q33 | 7N | D10 | 13I | D21 | 7C | D41 | 6H |
| IC400 | 2K | Q14 | 10N | Q23 | 7E | Q34 | 10Q | D11 | 12G | D23 | 12R | | |
| Q1 | 11B | Q15 | 12O | Q24 | 8B | Q36 | 9K | D14 | 10H | D24 | 8D | | |
| Q3 | 12H | Q16 | 13M | Q25 | 7K | D1 | 13D | D15 | 10B | D27 | 8D | | |

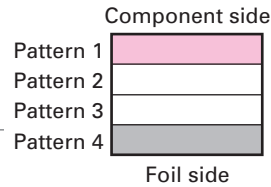
J72-0810-02 A/2

52

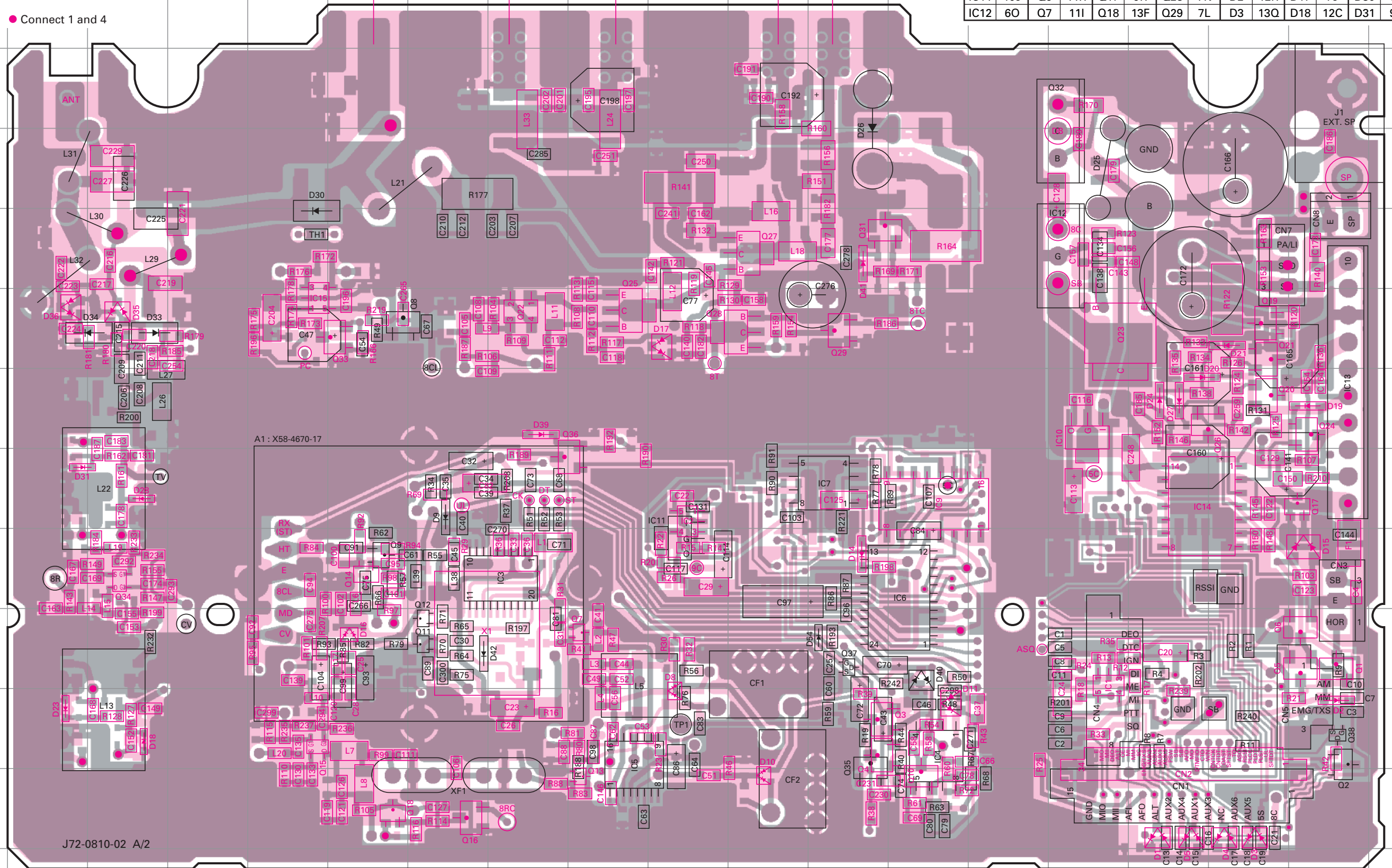
14

TK-863G PC BOARD VIEW

TX-RX UNIT (X57-6490-10) (A/2) Component side view + Foil side (J72-0810-02)

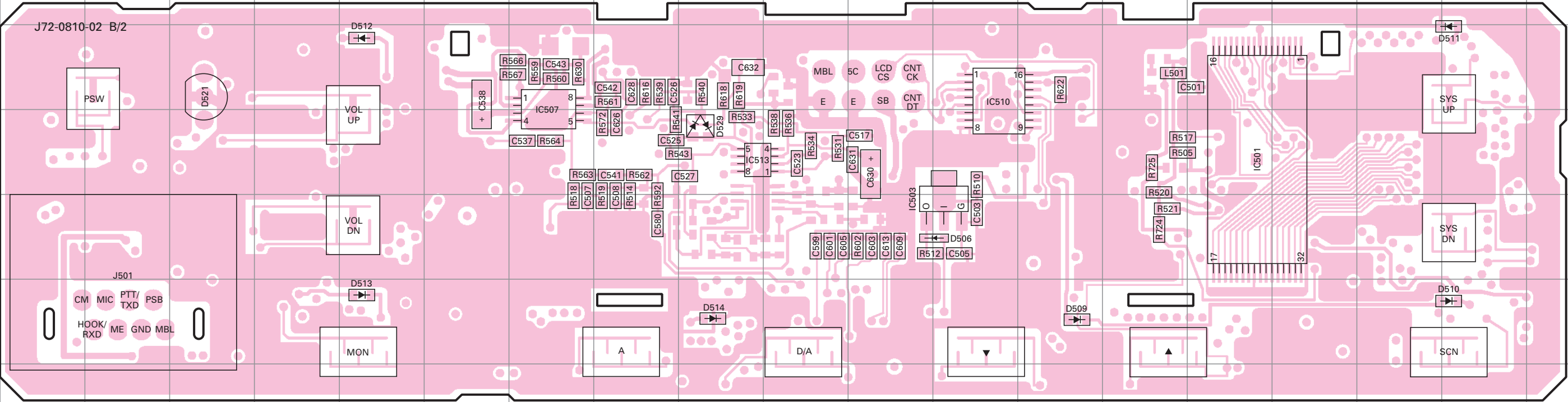


● Connect 1 and 4



| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| IC1 | 11O | IC13 | 8R | Q8 | 7F | Q19 | 7Q | Q31 | 6L | D4 | 13Q | D19 | 8R | D33 | 7C |
| IC2 | 9J | IC14 | 9P | Q9 | 10F | Q20 | 8Q | Q32 | 4O | D5 | 13P | D20 | 8P | D34 | 7C |
| IC3 | 10H | IC15 | 7E | Q10 | 13M | Q21 | 7Q | Q33 | 7F | D8 | 12J | D21 | 7Q | D35 | 7C |
| IC4 | 12M | IC400 | 2I | Q11 | 11G | Q22 | 7H | Q34 | 10C | D9 | 9G | D23 | 12B | D36 | 7B |
| IC5 | 12I | Q1 | 11R | Q12 | 11G | Q23 | 7O | Q35 | 12L | D10 | 13K | D24 | 8P | D39 | 8H |
| IC6 | 10M | Q2 | 12R | Q13 | 13I | Q24 | 8R | Q36 | 9I | D11 | 12M | D25 | 5O | D40 | 11M |
| IC7 | 9L | Q3 | 12L | Q14 | 10F | Q25 | 7I | Q37 | 11L | D14 | 10L | D26 | 5L | D41 | 6L |
| IC9 | 9M | Q4 | 12L | Q15 | 12E | Q26 | 8Q | Q38 | 12R | D15 | 10R | D27 | 8P | D42 | 11G |
| IC10 | 8O | Q5 | 11R | Q16 | 13G | Q27 | 6K | D1 | 13P | D16 | 11F | D28 | 9C | D54 | 11L |
| IC11 | 10J | Q6 | 11R | Q17 | 9R | Q28 | 7K | D2 | 12R | D17 | 7J | D30 | 6E | | |
| IC12 | 6O | Q7 | 11I | Q18 | 13F | Q29 | 7L | D3 | 13Q | D18 | 12C | D31 | 9B | | |

TX-RX UNIT (X57-6490-10) (B/2) Component side view (J72-0810-02)



| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| IC501 | 3O | IC510 | 2L | D509 | 5M | D512 | 2E | D521 | 2C |
| IC503 | 4L | IC513 | 3I | D510 | 5R | D513 | 5E | D529 | 3I |
| IC507 | 2G | D506 | 4L | D511 | 2R | D514 | 5I | | |

Component side

Pattern 1

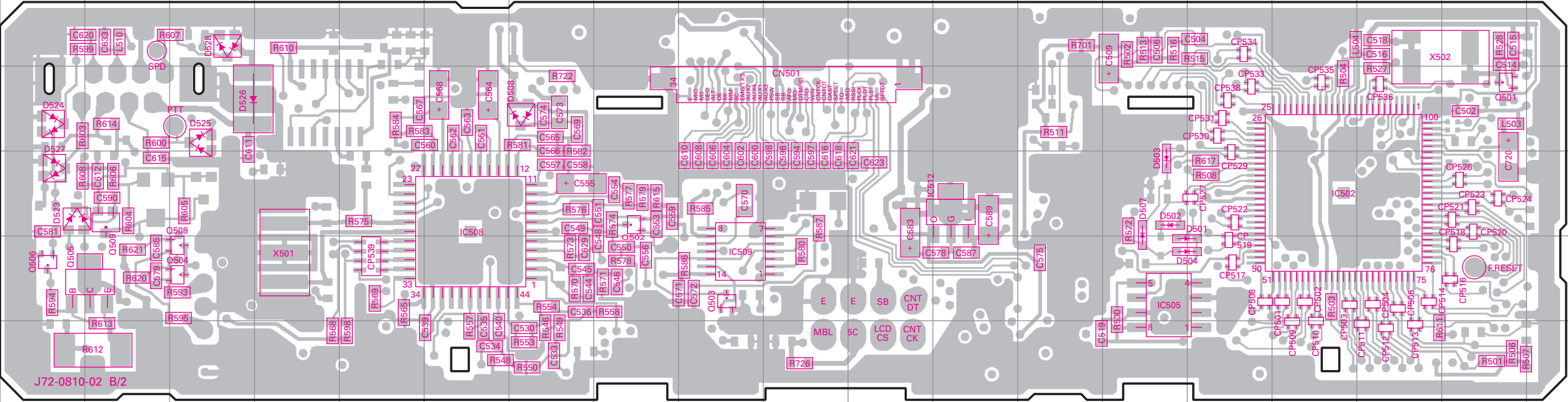
Pattern 2

Pattern 3

Pattern 4

Foil side

TX-RX UNIT (X57-6490-10) (B/2) Foil side view (J72-0810-02)



| Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address | Ref No. | Address |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| IC502 | 10P | IC509 | 11I | Q502 | 10H | Q505 | 11B | Q509 | 10B | D503 | 10N | D508 | 9G | D525 | 9C |
| IC505 | 11N | IC512 | 10L | Q503 | 11I | Q506 | 11A | D501 | 11O | D504 | 11O | D523 | 10A | D526 | 9C |
| IC508 | 10F | Q501 | 9R | Q504 | 11C | Q508 | 11C | D502 | 10N | D507 | 10N | D524 | 9A | D527 | 10A |

Component side

Pattern 1

Pattern 2

Pattern 3

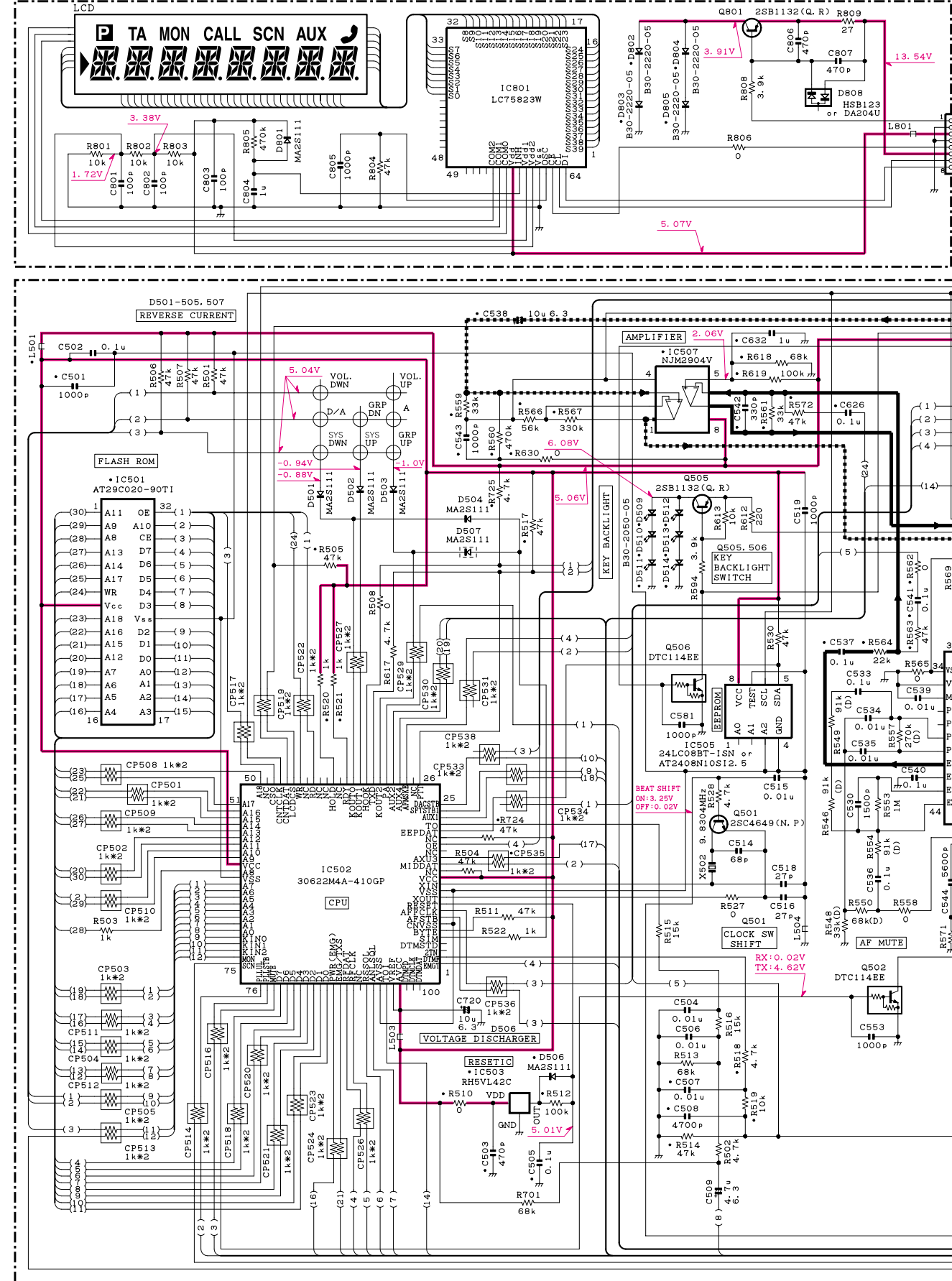
Pattern 4

Foil side

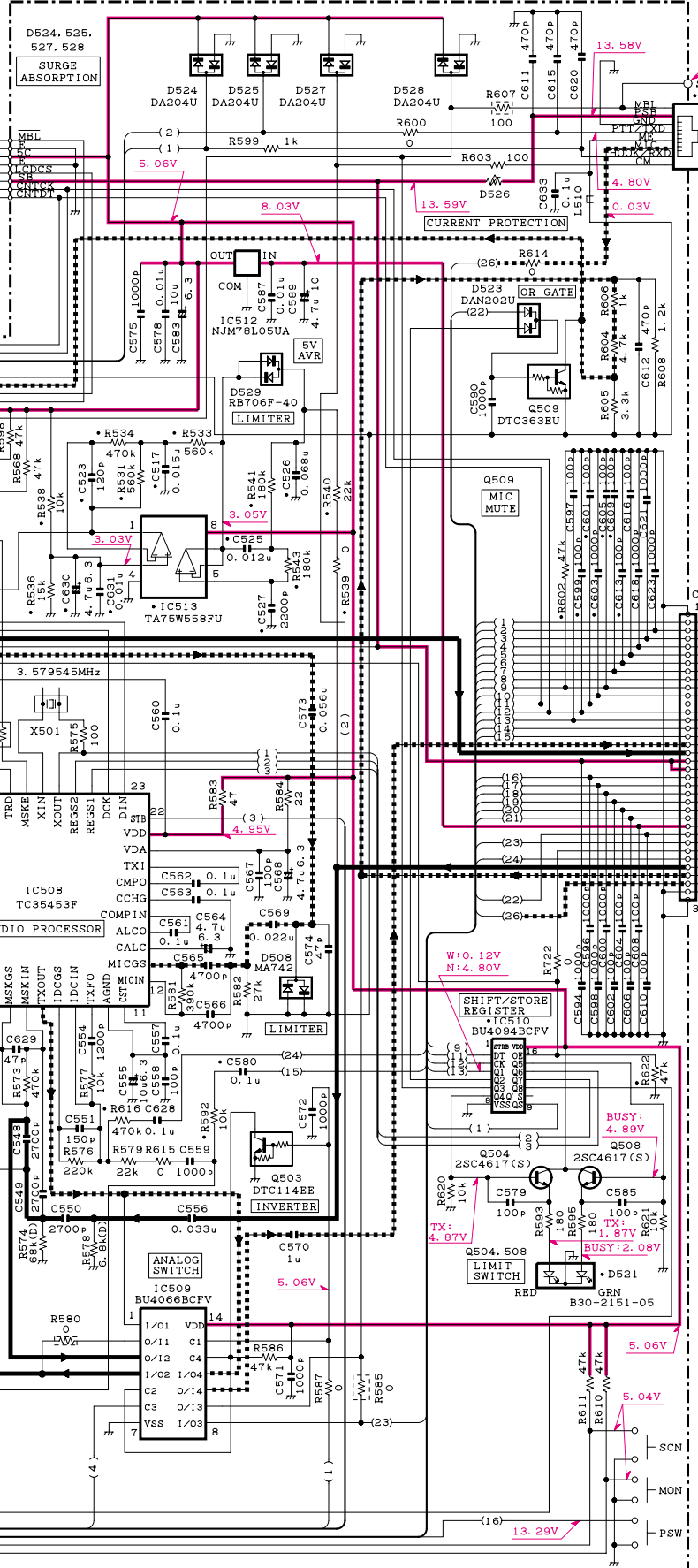
Note : Components marked with a dot (.) are parts of patterun 1.

SCHEMATIC DIAGRAM TK-863G

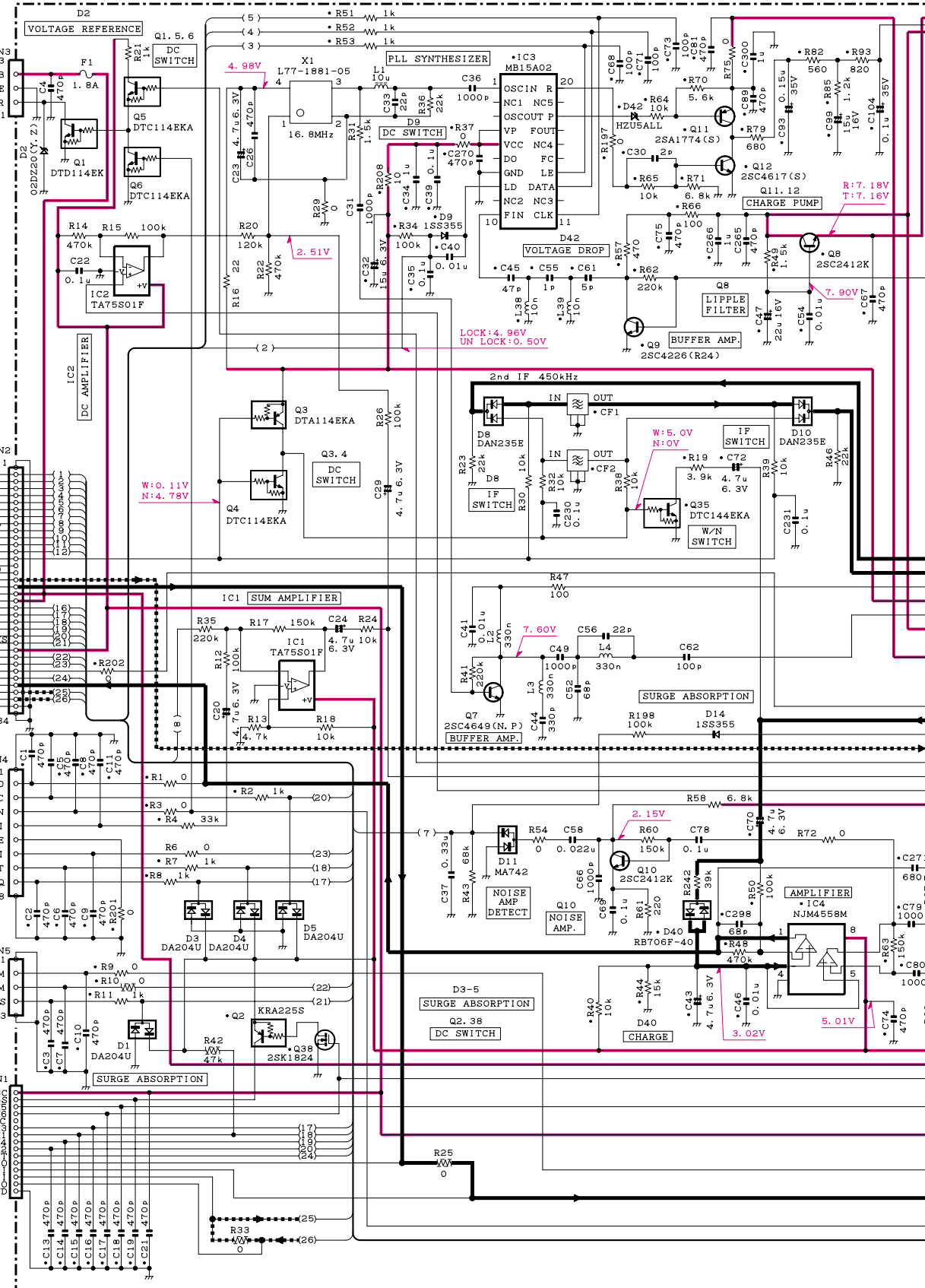
X54-3270-10 DISPLAY UNIT



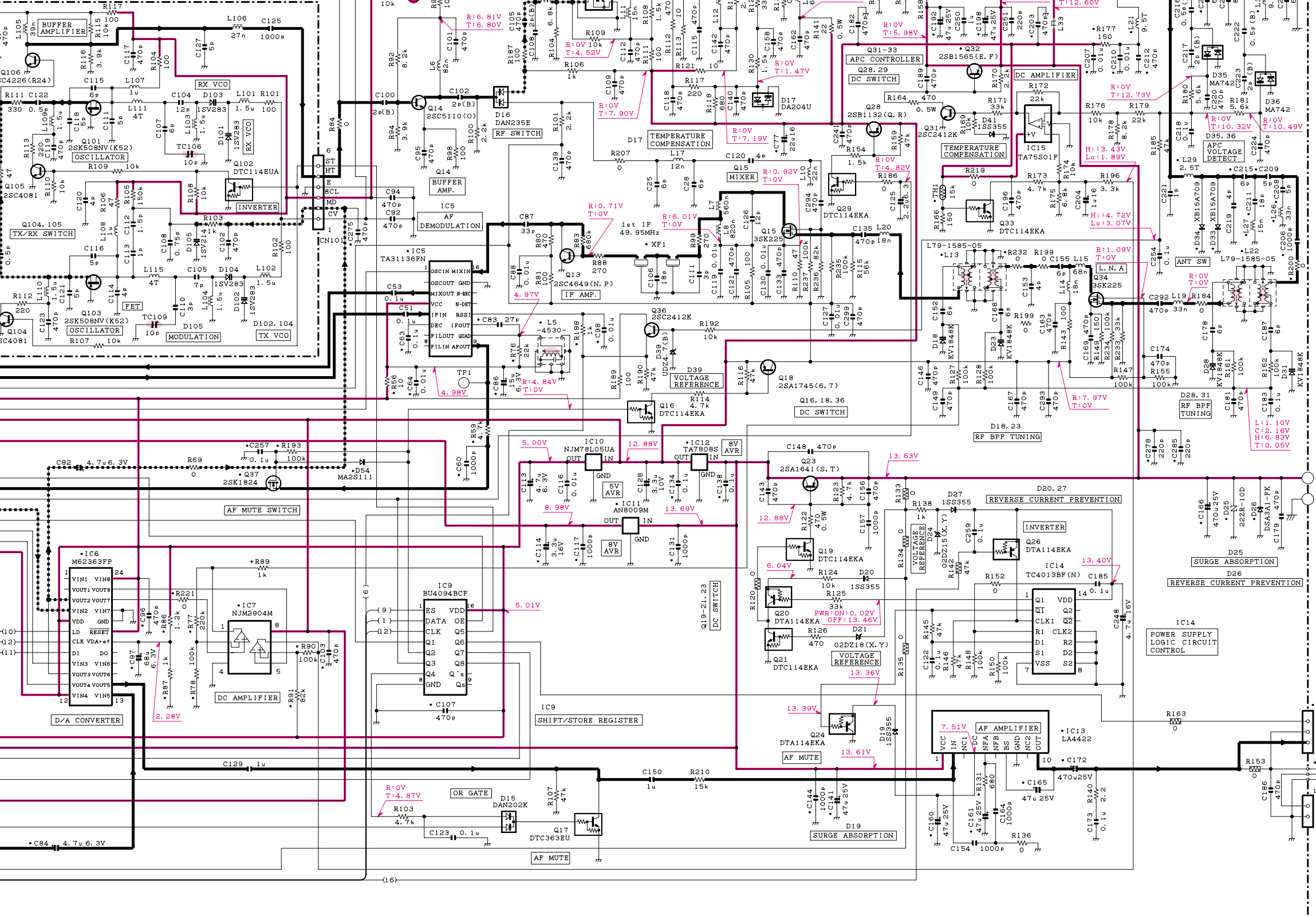
X57-6490-10 CONTROL UNIT



X57-6490-10 TX-RX UNIT



X58-4670-17 VCO UNIT



| Pin No. | Name | Function |
|---------|------|---|
| 1 | 8C | DC 8V output. |
| 2 | 5S | DC 5V output. |
| 3 | AUX5 | |
| 4 | AUX6 | Auxiliary output. |
| 5 | NC | Non-connection |
| 6 | AUX3 | SQ : Squelch detect output. *1 |
| 7 | AUX1 | PTT : External PTT input. *1 |
| 8 | AUX4 | |
| 9 | AUX2 | DTC : Data channel control/External hook input. |
| 10 | ALT | Alert tone input. |
| 11 | AFO | Receiver audio signal output. |
| 12 | AFI | Receiver audio signal input. |
| 13 | MII | Transmit audio signal input. |
| 14 | MIO | Transmit audio signal output. |
| 15 | GND | Ground |

| Pin No. | Name | Function |
|---------|------|---|
| 1 | HOR | Horn alert/call output. |
| 2 | E | Ground. |
| 3 | SB | Switched B+, DC 13.6V output, Maximum 1A. |

| Pin No. | Name | Function |
|---------|------|---|
| 1 | DEO | Receiver detector output. Level : 0.35Vrms (Standard modulation) |
| 2 | DTC | Data channel control/External hook input. |
| 3 | IGN | Ignition sense input. |
| 4 | DI | Data modulation input. Level : 0.7Vrms at 3kHz deviation |
| 5 | ME | External microphone ground. |
| 6 | MI | External microphone input. |
| 7 | PTT | External PTT input, active low. |
| 8 | SQ | Squelch detect output. |

| Pin No. | Name | Function |
|---------|---------|---|
| 1 | SFTDT | Serial data for IC9 (Shift register). |
| 2 | UL | Lock detect. |
| 3 | PLST | Strobe signal for IC3 (PLL IC). |
| 4 | PLDT | Serial data for IC3 (PLL IC). |
| 5 | PLCK | Clock pulse for IC3 (PLL IC). |
| 6 | RSSI | Receive signal strength indicator. |
| 7 | ASQ | Analog squelch. |
| 8 | TO | Transmit sub-tone signal output. |
| 9 | SFTST | Strobe signal for IC9 (Shift register). |
| 10 | DAST | Strobe signal for IC6 (Shift register). |
| 11 | CNTDT | Control serial data for IC6. |
| 12 | CNTCK | Control clock pulse for IC6. |
| 13 | W/N | Change signal of wide or narrow. |
| 14 | CTO | Received sub-tone signal. |
| 15 | DTMFIO | DTMF signal. |
| 16 | MO | Modulation signal. |
| 17 | AFO | Receiver audio signal. |
| 18 | SB | Switched B. |
| 19 | SB | Switched B. |
| 20 | PSW | Power switch. |
| 21 | AUX3 | Squelch detect output. |
| 22 | AUX1 | External PTT input. |
| 23 | AUX4 | |
| 24 | AUX2 | |
| 25 | EMG/TXS | Foot switch input signal. |
| 26 | 8C | DC 8V. |
| 27 | MM | MIC mute. |
| 28 | MI | External MIC input signal. |
| 29 | OE | Output enable for IC9 (Shift register). |
| 30 | ALT | Alert tone signal. |
| 31 | DEO | Receiver detector output. |
| 32 | MII | Transmit audio signal input. |
| 33 | MIO | Transmit audio signal output. |
| 34 | GND | Ground. |

| Pin No. | Name | Function |
|---------|---------|---|
| 1 | AM | Speaker mute input, active high. |
| 2 | MM | MIC mute input, active high |
| 3 | EMG/TXS | EMG : Foot switch input, active low. *2 |

| Pin No. | Name | Function |
|---------|-------|---|
| 1 | PA/LI | Relay for PA function KAP-1 control. "H" : PA/LI on, "L" : PA/LI off |
| 2 | SPO | Audio signal output to KAP-1 |
| 3 | SPI | Audio signal inpt from KAP-1 |

| Pin No. | Name | Function |
|---------|------|---|
| 1 | SP | Audio signal output to internal/external speaker. |
| 2 | E | Ground |

| Pin No. | Name | Function |
|---------|----------|------------------------|
| 1 | MBL | MIC backlight control. |
| 2 | PSB | 13.6V. |
| 3 | GND | Ground. |
| 4 | PTT/TXD | PTT. |
| 5 | ME | MIC ground. |
| 6 | MIC | MIC signal input. |
| 7 | HOOK/RXD | Hook detection |
| 8 | CM | MIC data detection. |

| Pin No. | Name | Function |
|---------|---------|---------------------------------------|
| 1 | CV | Control voltage input. |
| 2 | MD | Modulation input. |
| 3 | 8CL | 8V input. |
| 4 | E | Ground. |
| 5 | HT | Signal output. |
| 6 | RX (ST) | Switched transmit input. H : Transmit |

*1 : MDT mode

*2 : Emergency mode

SPECIFICATIONS

GENERAL

| | |
|-----------------------------------|--|
| Frequency Range | 450 to 490MHz |
| Number of Systems | Maximum 32 systems |
| Number of Groups | Maximum 250 groups |
| Channel Spacing | Wide : 25kHz Narrow : 12.5kHz |
| PLL Channel Stepping | 5, 6.25kHz |
| Operating Voltage | 13.6V DC \pm 15% |
| Current Drain | Less than 0.4A on standby Less than 1.0A on receive Less than 8.0A on transmit |
| Operating Temperature Range | -30°C to +60°C (-22°F to +140°F) |
| Dimensions & Weight | 140 (5-33/64) W x 40 (1-37/64) H x 145 (5-45/64) D mm (inch), 940g (2.07 lbs) |
| Channel Frequency Spread | 40MHz |

RECEIVER (Measurements made per EIA standard EIA/TIA-204-D)

| | |
|--------------------------------|--|
| Sensitivity (12dB SINAD) | Wide : 0.28 μ V Narrow : 0.35 μ V |
| Selectivity | Wide : 80dB Narrow : 65dB |
| Intermodulation | Wide : 75dB Narrow : 63dB |
| Spurious Responce | 85dB |
| Audio Power Output | 4.0W |
| Frequency Stability | \pm 2.5ppm |

TRANSMITTER (Measurements made per EIA standard EIA-152-C)

| | |
|------------------------------|--------------------------------------|
| RF Power Output | 25W |
| Spurious and Harmonics | 65dB |
| Modulation | Wide : 16K0F3E Narrow : 11K0F3E |
| FM Noise | Wide : 50dB Narrow : 45dB |
| Audio Distortion | Less than 3% |
| Frequency Stability | \pm 2.5ppm |

TK-863G

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